COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Boston, Mass., and additional mailing offices

Price 50¢/copy — October 10, 1973 — Vol. VII, No. 41

NEWS IN BRIEF

NEWSPAPER

Some Calif. Software Permanently Tax-Free

SACRAMENTO, Calif — Gov. Ronald Reagan last week signed into law a bill making certain software permanently exempt from taxation as tangible, personal property.

Only those programs that are basic operating programs will be taxed. Excluded from taxation are processing programs such as language translators and service programs.

Richardson Plans Laws On NCIC CCH Safeguards

BOSTON — US Attorney General Elliot L. Richardson said last week he has promulgated and will release soon regulations to safeguard the operation of the FBI's Computerized Criminal History file. Richardson said he has drafted but not yet introduced legislation ensuring such safeguards.

His statement was in response to a petition filed in Washington against Richardson and FBI Director Clarence Kelley in August by the American Civil Liberties Union and Massachusetts Gov. Francis W. Sargent [CW, Aug 15].

This response, in addition to the Justice Department's dropping of its suit against Massachusetts [CW, Oct. 3], shows that "they have taken action," according to Andrew Klein, aide to Sargent. However, he said, "they haven't perhaps gone as far as we'd like."

'74 CDP Study Guides Out

PARK RIDGE, Ill. — Copies of study guides for the 1974 Certificate in Data Processing (CDP) examination are available from Data Processing Management Association (DPMA).

The deadline is Nov. 1, 1973 for filing applications for the examination to be held Saturday, Feb. 16, 1974.

Copies of the guide are available from DPMA International Headquarters, Certification and Testing Section, Education Department, P.O. Box 195, Park Ridge, Ill. 60068.

On the Inside This Week

Mammoth DP Conversion Involves 1,100 Programs — Page 6

Bell: Local Loops Need State Approval — Page 17

Communications 17
Computer Industry 23
Editorial 8
Financial 38
Professional Practices 12
Software/Services 13
Systems/Peripherals 19

25% Price Cuts Seen if CDC Unbundles

By Michael Weinstein
Of the CW Staff

MINNEAPOLIS — Control Data Corp. is working on a plan for separate pricing of all hardware and software components that could mean a 25% reduction in the cost of the hardware, according to Jim Murdaks, vice-president of Control Data Marketing Co.

If and when this plan becomes a reality, users will be able to specify and order systems exactly tailored to their needs, Murdakes said.

For example, a very sophisticated user who wanted to write his own operating software and/or use special hardware could order only the hardware and software he needed.

Separate pricing is both practical and overdue, Murdakes said. "Over the past several years the cost of developing and building hardware has been declining while during the same period of time the cost of writing software has been increasing."

At the present time CDC spends about 60% of its research and development budget for software, he said.

But as the basis for pricing systems has remained structured around the hardware, the situation is that hardware subsidizes software. If the prices for equipment were allowed to reflect the real cost of development, users would see a decreasing price for the hardware accompanied by an increasing price for the software, he indicated.

Unfortunately for the user, he has seen neither, since in most cases he buys a complete package.

Under the proposed CDC plan the user would be provided with a price

(Continued on Page 2)

Anticompetitive Charges

Calcomp Hops on IBM Suit Bandwagon

By E. Drake Lundell Jr.
Of the CW Staff

LOS ANGELES — Calcomp has become the first of the independent peripherals or leasing firms to sue IBM in the wake of the decision in the IBM-Telex case. With last week's filing in Federal District Court for the Central District here Calcomp claimed damages "in excess of $100 million."

While Calcomp noted the exact amount of the damages would have to be determined in the trial, the award could run to over $300 million since actual damages are tripled in antitrust suits — that is, if Calcomp is successful.

Commenting on press reports of the action, IBM said the suit "is without merit and we will defend ourselves vigorously."

The Calcomp suit, which closely parallels the Telex action, claimed that in the 1969 to 1972 time period IBM attempted to destroy, suppress and eliminate competition in the plug-compatible peripherals area of the computer industry.

This was accomplished by IBM, the suit indicated, by cutting prices on independent peripheral equipment while at the same time raising prices on central processors, so the user continued to pay approximately the same prices for his total system while the competition in the peripherals area was cut out of the market.

Calcomp officials indicated their action against IBM would rely heavily on many of the same documents used by Telex in its case against the industry leader since those documents are now in the public record.

In addition, legal sources noted that since those documents are now public record it might be easier and faster to try the Calcomp actions since the amount of time needed for discovery might be reduced.

Telex spent over a year combing through IBM records to find the documents that the judge found so convincing of IBM's monopolistic intent and practices.

At the same time, Calcomp stands less of a chance to be challenged on theft of trade secrets grounds, Calcomp spokesmen noted, than was Telex since Calcomp has never made a practice of hiring engineers from IBM.

Personnel From XDS

The firm, which got into the plug-compatible peripherals business in mid-1969, was founded primarily by personnel from Xerox Data Systems, and out of its engineering staff only one or two employees ever worked for IBM — and they had worked for some other firm between the time they left IBM and joined Calcomp, the spokesmen said.

In the Telex case IBM countersued Telex for theft of trade secrets and unfair business practices and won a judgment of $21.9 million on those charges due largely to the Telex practice of luring IBM engineers away and offering them huge bonuses to duplicate products they had been working on at IBM.

The IBM countersuit also served to tie up the management of Telex for a considerable period of time, sources noted, because of the necessity of taking depositions — a delay that almost caused a delay in the trial and certainly took Telex management's attention away from its business for a considerable time.

Guilty Plea Filed In '70 Bombing At Army Center

By Marguerite Zientara
Of the CW Staff

MADISON, Wis. — A former University of Wisconsin student has pleaded guilty to charges stemming from the Aug. 24, 1970, bombing of the University of Wisconsin Army Mathematics Research Center in which a physics researcher was killed and a Control Data Corp. 3600 system was destroyed.

Karleton Louis Armstrong made his plea before Circuit Judge William C. Sachtjen to reduced state charges of second-degree murder and arson.

Armstrong also pleaded guilty before federal Judge James E. Doyle to several federal charges related to the center's bombing as well as another attempted bombing — of the Baraboo, Wis., Army munitions plant on Jan. 1, 1970.

The federal charges relating to the university bombing include a conspiracy count, involving the destruction of government property — specifically, a computer and a nuclear accelerator owned by the Atomic Energy Commission — as well as two charges connected with the federal firearms statutes, according to the U.S.

(Continued on Page 2)

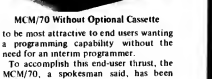
APL-Dedicated Microprocessor Has 16K Memory, Weighs 20 Lbs

By Michael Weinstein
and Don Leavitt
Of the CW Staff

ONTARIO, Canada — A full APL (A Programming Language) capability is available in a portable computer system weighing less than 20 lbs and costing $7,800 from Micro Computer Machines, Inc., here.

The basic microprogrammed machine comes with central processor, 16K bytes of memory, typewriter keyboard, plasma display screen and an optional ($1,500) cassette tape subsystem. The system is operated either from internal rechargeable batteries or from standard electrical current.

Due to the nature of APL, size of the system and cost, the MCM/70 is expected to be most attractive to end users wanting a programming capability without the need for an interim programmer.



MCM/70 Without Optional Cassette

To accomplish this end-user thrust, the MCM/70, a spokesman said, has been designed to overcome two historic drawbacks of APL:

- Poor data base capabilities that

(Continued on Page 2)

20-Lb APL-Dedicated Microprocessor Has 16K Memory

(Continued from Page 1)

limited usage in business applications.

- Difficulty in handling external I/O

Low-Cost System

The internal processor is a microprogrammed machine with memory divided into two sections by function.

Read-only memory (ROM) comprises 14 bytes and contains the microcode needed to run APL.

The remaining 2K bytes (in the base machine) acts as the user's computer or target machine and is built around a random-access memory (RAM) The basic 2K bytes is optionally expandable to 8K bytes.

IBM's current release of APL for the System 360 is keyed to self-contained workspaces of 32K bytes each, which includes program logic and the data to go with it. Various time-sharing services offer extended APL with the potential for much larger workspaces and, in some cases, a file system so that data outside the workspace can be accessed.

More Than Adequate

While a work area of only 2K bytes may therefore seem small, the MCM spokesman stated, it is more than adequate due to the compact nature of APL.

"For example, computing the average of a set of numbers would take more than 11 statements in Basic, 10 lines in Fortran and only one statement in APL. Sorting a set of numbers would take 10 statements in Basic, 20 lines in Fortran and again, only one statement in APL," the spokesman stated.

Some commercial APL-oriented time-sharing services, contacted by *Computer world*, agreed that space provided by the MCM/70 "probably is adequate" for many jobs, since users typically do not in fact use even the 32K bytes IBM provides in its workspaces

Main vehicle for user input, the APL keyboard part of the MCM package consists of 46 keys, one unassigned key and control keys.

Input or referenced statements can be viewed on the one line plasma display screen that shows 32, 5 x 7 dot matrix characters.

Direct storage is provided through the optional magnetic tape cassette that is treated by the computer as a random-access device. This random-access treatment is meant to overcome the historical weakness of poor file handling.

No Records

Traditionally, APL has been hooked to storage devices built around records, but records are inappropriate for APL, the spokesman said.

APL is basically an array-oriented language, and the use of single line records acts to destroy the symmetry of the array. The MCM/70 works around this by having the cassette system transfer data to the central processor for internal storage in the form of arrays, the spokesman said.

Users can view this operation as similar to virtual memory with the central processor swapping data into and from the cassette tape, he indicated.

Total storage capacity for the cassette subsystem is 160K bytes with a transfer speed of 900 char/sec.

Tape search speed is 40 in/sec with read/write speed at 10 in/sec.

For hardcopy output a 5 x 7 dot matrix printer is optional in the form of a plug-in module in a separate chassis.

It provides for printing upper-case and lower-case as well as APL symbols. Line width is 34 characters with line spacing at 6 line/in. Print speed is 110 char./sec with a maximum line speed of 4 line/sec.

Other options include a communications interface capable of data rates up to 9,600 bit/sec – asynchronous; a CRT display – 16 lines of 64 characters; 132-column printer; and the option that allows battery operation.

The inclusion of diverse peripherals acts to overcome the second weakness of APL – the inability to handle external I/O, the spokesman said.

Initially APL was designed by Ken Iverson and picked up by IBM in the mid-1960s to operate to and from the IBM Selectric terminal. Other firms added different peripheral capabilities, but, as they were produced separately and were proprietary, there was no standard.

The MCM/70 is designed using a general I/O facility that will facilitate the use of different peripherals, the spokesman said.

Micro Computer Machines, Inc., is at 4 Lansing Sq., Willowdale, M2J 1T1.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
™ Reg. U.S. Pat. Off.

DR. H.R.J. GROSCH, *editorial director*

EDWARD J. BRIOE, *editor*

V.J. FARMER, *managing editor* RONALD A. FRANK, *technical news editor*, E. DRAKE LUNDELL JR., *computer industry editor*, MARVIN ARONSON, *assistant managing editor*, DONALD LEAVITT, *software editor*, MICHAEL WEINSTEIN, *systems editor*, MARY UPTON, *financial editor and assistant computer industry editor*, LESLIE FLANAGAN, JUDITH KRAMER, *copy editors* PATRICK G. WARD, TONI WISEMAN, MARGUERITE Y. ZIENTARA, *staff writers*

E. DRAKE LUNDELL JR., *Washington bureau* MARIAN SMALHEISER, *West Coast bureau* J.H. BONNETT, *European bureau*, HIDETSUNA SASAKI, *Asian bureau*

CONTRIBUTORS: J. DANIEL COUGER, *education columns*, FRANK GREENWOOD, *management columns*, ALAN TAYLOR, *Taylor Report and professional practices*.

NEAL WILDER, *vice president – Sales* GORDY TRAVIS, *Sales administrator*, JUDY MILFORD, *advertising coordinator*, KATHRYN V. OINNEEN, *market research*.

LEETE OOTY, *production manager*, HENRY FLING, *production supervisor*.

W. WALTER BOYD, *publication manager*, PATRICK J. McGOVERN, *publisher*.

EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160. Phone: (617) 965-5800. Telex: 92-2529. Washington: Room 1129, National Press Bldg., Washington, D.C. 20004. Phone: (202) 638-0901. Telex: 89-544. Los Angeles: 962 N. Edgefield Drive, Los Angeles, Calif. 90026. Phone: (213) 665-6008. Europe: Computerworld, c/o IDC Europa, Ltd., 140-146 Camden Street, London NW1 9 PF, England. Phone: (01) 485-2248/9. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. © 1973 by Computerworld, Inc.

25 cents a copy; $9 a year in the U.S.; $10 a year in Canada; all other foreign, $28 a year.

MARGARET PHELAN, *circulation manager*. Four weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160

Reproduction of material appearing in *Computerworld* is strictly forbidden without written permission. Send all requests to publication manager.

Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilms, Periodical Copy Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. Y

COMPUTERWORLD, INC.

Patrick J. McGovern ..... *president*
H. Walter Boyd ..... *executive vice president*
Robert M. Pelletron ..... *vice president–int'l.*
T. Neal Wilder ..... *vice president–sales*

ABP AIA

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Mass. 02160.

Computation Method in Error

Welfare Recipients Shortchanged for 14 Years

By Marguerite Zientara
Of the CW Staff

BOSTON – A sharp-eyed systems analyst who discovered in 1971 that the Massachusetts Welfare Department had been incorrectly computing cost-of-living budget increases for at least 14 years said many thousands welfare recipients are still being short-changed.

Arthur B. Beroz, the systems analyst, said: "The computation method has been corrected but there are still the accumulated deficiencies over the years that resulted in welfare recipients receiving an average of 8.3% less than they should be getting today."

The standard formula for computing cost-of-living budget increases, according to Sumner Hoisington, assistant commissioner for research and planning for the department, is to "keep track on a monthly basis of the change in the consumer price index published by the Bureau of Labor Statistics.

"When that index, over a period of months, has increased by 3%, then we apply the 3% figure to the base budget in the old age assistance program, thus passing the cost-of-living increase along to the recipient."

The "error," which Hoisington prefers to think of as a "very literal interpretation" of the original legislation, stems from applying the 3% increase to the original basic budget each time, instead of to the figure obtained from the last increase, according to Hoisington.

Beroz stated and Hoisington confirmed that the incorrect formula was used to compute cost-of-living budget increases between 1957 and 1971 for recipients in all categories: old age assistance, disability assistance, and to families with dependent children and general relief.

In September 1971 the formula was changed to halt the growth in the percentage of the disparity, according to Hoisington, so that now the computation "does increase their grant by somewhat more than would otherwise have been the case." Recipients today are receiving the amounts they should be, according to Hoisington.

Hoisington claimed retroactive adjustments could not and would not be made. "In no way is it possible to reconstruct the caseload, and fiscal constraints make payment impossible."

Beroz thought retroactive payments "legally should be made," but acknowledged that the welfare recipients "lived through" the time of underpayments.

L.A. County Reviewing NCIC

LOS ANGELES – Los Angeles County Supervisor Baxter Ward, inspired by newspaper articles dealing with the concern of Massachusetts and other states about abuse of criminal history files, has initiated a review of the county's system

Through a recent *Los Angeles Times* article, Ward, according to Deputy Lance Brisson, learned that non-law enforcement people have access to the national FBI system (NCIC) and that California is one of only six states hooked up as contributors of information to the system.

Ward then asked for, and the board of supervisors ordered, a study by the county's chief administrative officer of the safeguards now in place and whether additional safeguards are needed.

The study is being undertaken only in Los Angeles County, Brisson said.

If it is true that non-law enforcement agencies can access the county's information from other states – a major issue in the Massachusetts controversy [CW, July 11] – "then we'd have to consider whether or not it is advisable for our agencies to continue to contribute information to that system," Brisson said.

"Our interest is in protecting the civil liberties of the citizens of this county, not in the effectiveness of the system from a law enforcement point of view," Brisson said.

Guilty Plea Filed in '70 Bombing

(Continued from Page 1)

Attorney's Office in Madison. The two firearms charges involve the construction of and the possession and use of destructive devices.

The CDC system included eight tape drives, three drums and a 924 optical scanner. In addition, a Univac 9300 terminal was on-line to a Univac 1108 in the university's data center blocks away. A small system was built around a Honeywell DDP 124 and another, around a Scientific Control Corp. 4700.

Estimates of the total damage to the research center were set at $1.5 million. Damage to the building, which housed the accelerator, was set at $5 million to $6 million.

Armstrong, 26, faces possible maximum sentences of 70 years' imprisonment on the federal charges and 95 years on the state charges. However, lawyers for Armstrong's defense have negotiated with state and federal prosecutors to provide that the maximum penalty for both federal and state charges shall not exceed 25 years, with both sentences to run concurrently.

On the state level, a mitigation hearing is scheduled Oct. 15 to allow Armstrong to explain his motives for his alleged actions. Sachtjen will then decide his actual sentence.

On the federal level, Doyle will base his decision on the entire court record and the presentence report which will be ready in about six weeks, according to the federal court clerk. Armstrong has not requested a hearing concerning the length of the sentence.

CDC May Unbundle

(Continued from Page 1)

list of all possible hardware and software modules with each price based on a real value. This would allow the user to specify his system and pay exactly for what he wanted, knowing that part of his total system cost would not be used to subsidize the hardware and software for other users, Murdaken stated

On the hardware side this separate pricing could mean price reductions of about 25%, he indicated. This would naturally be accompanied by an increase in the price of software, but over time the cost for a fully loaded system would remain constant.

Another Benefit

A secondary benefit of separate pricing could also be increased competition between CDC and the independent software houses which could act to lower software pricing.

Murdakes acknowledged this possibility and said CDC welcomed the competition since it had faith in its own software development.

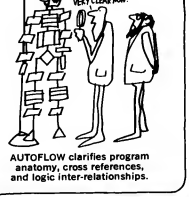
Did You Know?

One of a series MAKING IBM INSTALLATIONS WORK BETTER

50¢ of every DP $ is spent on program maintenance.* Reduce it with ADR Software.

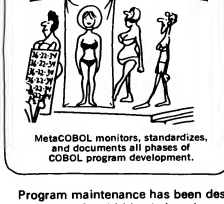
*EDP Analyzer, October 1972, That Maintenance "Iceberg," P.1. (Send for complimentary copy.)

ADR software products can help your company melt the maintenance "iceberg."

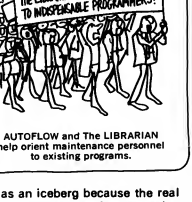


AUTOFLOW clarifies program anatomy, cross references, and logic inter-relationships.

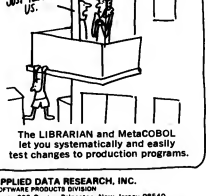
The LIBRARIAN gives you complete control over and audit of all program activity.



MetaCOBOL monitors, standardizes, and documents all phases of COBOL program development.



AUTOFLOW and The LIBRARIAN help orient maintenance personnel to existing programs.



The LIBRARIAN and MetaCOBOL let you systematically and easily test changes to production programs.

Program maintenance has been described as an iceberg because the real costs are often hidden below the surface. And maintenance keeps costing since the average production program has a life span of 10 years or more. This means continual change. As machine requirements change. As operations change. As your computer programs, systems and programmers keep changing to keep pace with your company's growth and development.

Look to ADR's software products to significantly reduce the time and money you spend on program maintenance. Find out today how AUTOFLOW, The LIBRARIAN, and MetaCOBOL will improve the quality, reliability—and maintainability—of your programs throughout their productive life. Just send us the attached coupon, or contact any ADR office.

APPLIED DATA RESEARCH THE SOFTWARE BUILDERS®

ADR software products: In use at over 2,500 installations worldwide.

APPLIED DATA RESEARCH, INC.
SOFTWARE PRODUCTS DIVISION
Route 206 Center, Princeton, New Jersey 08540
Telephone: (609) 921-8550

Yes, I want to know more about ADR aids in program maintenance:
☐ AUTOFLOW ® ☐ The LIBRARIAN ® ☐ MetaCOBOL ®

Name _____

Company _____ Title _____

Address _____

City _____ State _____ Zip _____

Telephone _____

Computer Configuration _____

I am also interested in:
☐ *EDP Analyzer* article, October 1972

Other ADR software systems:
☐ PI SORT . . . for faster sorting
☐ SAM . . . for planning
☐ ROSCOE . . . for on line program development

U.S. offices in Atlanta, Boston, Chicago, Cleveland, Detroit, Houston, Los Angeles, New York, Pittsburgh, Princeton, St. Louis, Washington, D.C.
Representatives in Australia, Austria, Belgium, Brazil, Canada, Denmark, England, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Puerto Rico, South Africa, Spain, Sweden, Switzerland, Taiwan, West Germany

VOLUME KEY PUNCHING
(402) 346-0330

"JUST MINUTES AWAY"

NOW
TWO LOCATIONS TO SERVE YOU . . .

Omaha and now Ft Worth, Texas
Fast, dependable service at low cost

AMERICANA KEY PUNCH

General Offices
Redick Tower
Omaha, Nebraska 68102
and
1121 East Loop 820 S.
Suite 401
Ft. Worth, Texas
(817) 457-1640

Two Input Errors Plague Seattle Election

Special to Computerworld

SEATTLE – Two small input errors caused king-sized headaches for King County election officials evaluating results of the recent primary.

The two errors, detected separately, brought two different challenges to the election results.

This is the second year of punched card balloting in Seattle.

First, a control card changing a preliminary vote tally from "summary" mode to "move" mode was inadvertently left out.

As a result, ballot counts which should have been entered as totals were added to previous totals instead. One result was a report of 87,000 persons voting for mayor in nearby Auburn, a city of 22,500. (Final totals show only 2,287 voted.)

This error only impacted preliminary unofficial ballot totals released for the convenience of a Seattle morning newspaper, according to Norward Brooks, King County director of records and elections. The morning newspaper reported the error, changing the result was "a stream of outrageously inaccurate election results" and "chaos."

The second error, seemingly more innocent, had a more serious impact. In some instances of several precincts voting in the same polling place, ballots were prepared to contain candidates for office in more than one precinct. Header cards, inserted in front of the punched card ballots, were to be used to screen out the tallying of votes cast across precinct lines.

But at least one header card was not inserted by election officials, and about 100 cross-precinct votes were counted which should not have been. The county's DP manager, Helmut Endress, explained: "We had people working 32 hours at a stretch, and I guess we just pushed them too hard."

The computing problems came on the heels of a telephone equipment breakdown election night in which 22 to 35 special election phone lines were out of commission, slowing vote counting from outlying precincts.

Election officials are carefully checking vote tallies to determine if any other errors were made.

Mass. Gov. Sargent Writes Governors on NCIC Curb

By Marguerite Zientara
Of the CW Staff

BOSTON – Massachusetts Gov. Francis W. Sargent, after receiving a letter from a citizen claiming he found nearly all the members of his family listed in the FBI's computerized criminal history file, has taken another step in his continuing protest against the computerized system [CW, July 11, Aug. 15].

Sargent has written letters to the nation's governors urging them to join him in petitioning the Justice Department and Congress to provide safeguards on the system which, he said, contains the names of "thousands of innocent citizens."

"Once a state joins NCIC (National Crime Information Center)," Sargent wrote, "a state's laws and procedures become ineffective as the state files are copied and stored for national dissemination . . ."

The letter Sargent received said a relative working as a deputy sheriff had checked his family through NCIC. He found the citizen's mother listed because when she was 18 years old neighbors complained of a noisy sorority party

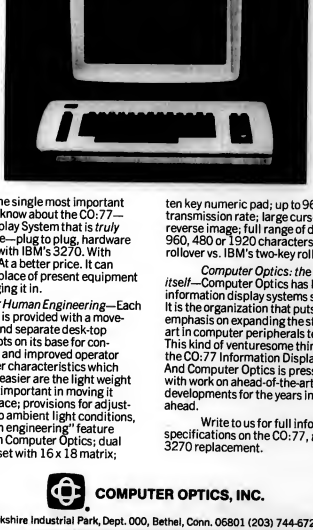
'74 NCC Plans Progress

MONTVALE, N.J. – Plans for the 1974 National Computer Conference are progressing with the conference date some seven months away.

This conference May 6-10, at McCormick Place in Chicago, will feature over 100 sessions in 15 designated areas of interest, according to the American Federation of Information Processing Societies.

The program includes 10 major industry applications – communications, health care and biotechnology, education, manufacturing, distribution, retail, government, finance, industrial process control and transportation – as well as five science and technological areas – computer architecture and hardware, software systems, computer networking, information management and management acceptance.

The IBM 3270 is a fine display system.
To compete with it, Computer Optics made a superior display system that is truly interchangeable and far less expensive.
We call it the CO:77



Here's the single most important fact you should know about the CO:77—it's the first Display System that is *truly* interchangeable—plug to plug, hardware and software—with IBM's 3270. With more features. At a better price. It can totally take the place of present equipment simply by plugging it in.

Superior Human Engineering—Each CO:77 operator is provided with a moveable keyboard and separate desk-top display that pivots on its base for convenient viewing and improved operator efficiency. Other characteristics which make usage far easier are the light weight of the terminal, important in moving it from place to place; provisions for adjusting the screen to ambient light conditions, another "human engineering" feature exclusively from Computer Optics; dual case character set with 16 x 18 matrix; ten key numeric pad; up to 9600 bps transmission rate; large cursor with reverse image; full range of display sizes: 960, 480 or 1920 characters; n-key rollover vs. IBM's two-key rollover.

Computer Optics: the company itself—Computer Optics has been selling information display systems since 1968. It is the organization that puts its *first* emphasis on expanding the state of the art in computer peripherals technology. This kind of venturesome thinking created the CO:77 Information Display System. And Computer Optics is pressing forward with work on ahead-of-the-art computer developments for the years immediately ahead.

Write to us for full information and specifications on the CO:77, *the* IBM 3270 replacement.

COMPUTER OPTICS, INC.
Berkshire Industrial Park, Dept. 000, Bethel, Conn. 06801 (203) 744-6720

RCA
CURRENT & FORMER
RCA
Computer Division
Employees And
RCA Computer
Customer User Personnel

The 1973 RCA Computer Alumni Locator will be going to press in a few short weeks.

For inclusion of your name please submit your business card or equivalent information

NOW

To: ED CUNNINGHAM
P.O. Box 864
Palatine, Ill. 60067
Over 5,000 Names

We're capable of anything. To help your computers do everything.

The Communications and Terminals Division of Sperry Univac specializes in developing total communications systems.

And it doesn't matter whether your mainframe comes from Sperry Univac or anybody else you can name.

It doesn't matter whether your communications requirements are room-to-room, plant-to-plant or nationwide.

It doesn't matter how you want to communicate. Or how fast you want to communicate.

What does matter is the experience, equipment and worldwide service organization we can offer you.

Beginning with the UNIVAC®3760 communications controller, your system builds. With the UNISCOPE® 100 display terminal, the DCT 500 keyboard-printer, the DCT 1000 remote-batch terminal, 610 tape cassette, card readers, paper tape equipment, etc.

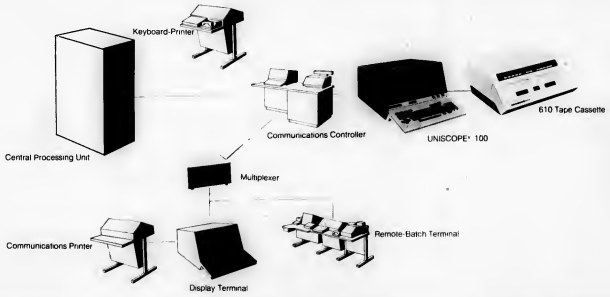
The result is a complete, flexible data communications system compatible with your computer.

All with the assurance of high-performance equipment.

The UNIVAC 610 tape cassette, for example, interfaces with the UNISCOPE® 100 display terminal for local, low-cost storage of up to 1.4 million characters. With a search speed of 120 inches per second. Dual cassettes let you edit and transfer information quickly, easily. The display terminal and tape cassette work together for dependable, low-cost solutions to a wide variety of data handling applications.

For a brochure on our total systems capability, contact the Sperry Univac representative in your area.

Or call free 800-453-5323.



COMMUNICATIONS AND TERMINALS DIVISION

SPERRY UNIVAC

Only when our customers succeed do we succeed.

SPERRY UNIVAC IS A DIVISION OF SPERRY RAND CORPORATION

Mammoth DP Conversion Involves 1,100 Programs

By Marvin Smalheiser
CW West Coast Bureau

SACRAMENTO, Calif. – The State Department of Human Resources Development (HRD) has completed one of the largest total computer conversions ever undertaken by a state or local government.

In shifting to an IBM 370/165 and a MS Cobol, some 1,100 programs were converted in a job that required 80 man-years of HRD staff time.

The cost of the conversion is estimated at $3 million "conservatively" for both hardware and software, according to Robert S. Clemons, data operations manager of HRD.

The conversion, he said, is providing significant savings, primarily in programming staff time for the maintenance of systems.

Two 360s, 7080

The HRD system, which handles unemployment and disability insurance payments, had consisted of two IBM 360/30s and an IBM 7080.

Seven different program languages, accumulated since the HRD got an IBM 702 Model I in 1956, had to be converted.

They included 702 Autocoder, 7080 Autocode, 7080 Cobol, 360 DOS Cobol, 360 Assembly, 1401 SPS (emulated on the 360/30) and Fortran.

The major problem, Clemons said, was the documentation and test data.

"Many of our programs were in use a number of years and were changed without changes in documentation," he said.

"Some test data was not sufficient to test all programs entirely and we had to spend time so we could test programs before and after the conversion."

Large Staff Involved

The HRD data processing division has a staff of 500, with 40 to 45 persons from systems and programming involved in the conversion. Another 30 people from management and technical support areas were heavily involved.

Clemons said 25 to 30 systems were analyzed.

Hardware Store

The HRD's hardware now includes the 370/165, which it purchased, and leased IBM peripherals that include 16, 3420 tape drives, 34 spindles of 3330 disk drives, four 1403N1 line printers, two card reader-punch combinations and two stand-alone card readers.

The CPU has 1M byte of core and HRD is acquiring an additional megabyte through competitive bidding.

Clemons said that because of the availability of funds and the savings available, the department chose to purchase the CPU.

The peripherals, he said, were leased from the same source to avoid a multiple supplier problem during the implementation of the system.

But by the end of this fiscal year, the department will have gone out to bid to replace all or some with competitive plug-to-plug devices.

The 370, HRD said, is the largest, fastest single processor computer system currently in use in California state government.

How It Was Done

The method HRD chose for the conversion was to give IBM a $1.2 million contract for the language translation.

Then IBM, because of the size of the job, subcontracted a portion of the work to Rend Teleprocessing, Inc., a Bay area computer software firm.

IBM converted 500, 360-type programs, Rand converted 400, 7080 programs and HRD converted 200 miscellaneous programs itself.

Clemons said it took almost two years from the time the first programs were sent to IBM until the conversion was completed and the system was up and running on May 31 of this year.

HRD said the effort was "painstakingly controlled to assure fair and even competition to all vendors."

It described the job as "one of the cleanest major computer acquisitions ever completed with California state government."

1973 COMPUTER INDEX

DP INDEX-73 All new guide to Greater S.F. Bay Area computers. The best info. available on 1000 computers at 600 sites. All verified in the last 3 months. Name, Address, Phone, DP Mgr., Computers, Peripherals. Use Computer Index to find MfV. & Model, City Index lists sites by Area. Send $30 check or PO to:

DP Index Company
999 Commercial St.
Palo Alto, Calif. 94303
(415) 327-1154

MOVING?

Please notify *Computerworld* at least four weeks in advance. When writing about your subscription, please enclose a recent mailing label. The code line on top may not mean much to you, but it is the only way we have of quickly identifying your records. If you are receiving duplicate copies, please send both labels.

797 Washington Street
Newton, Massachusetts 02160

I/O DEVICES 30 CPS IMPACT PRINTING TERMINALS

I O

- 132 print positions
- 96 Character ASCII set
- Interchangeable print wheel & ribbon
- 10,15, 30 CPS
- Full/half duplex operation
- Buffered Communications Interface (no nul or delay codes needed)
- High speed tab & visible tab stops
- On line self diagnostic
- On line tab setting
- On line ribbon color selection
- Full/half line forward/reverse spacing
- 6 carbon copies
- Reliable and easily maintained

Many machines installed as terminals and mini computer printers

Options

- Variable width tractor
- forms tractor with independent drive (to control 2 forms simultaneously)
- Front feed device
- Addressable tabulation to any position (forward or backward)
- Numeric keypad
- Top of form control
- Pin feed device
- Ability to control up to 3 forms independently

Dealers and distributors with strong sales and service capability wanted in many areas.

Call or write Barry DeVita,
I/O DEVICES, INC.
100 ROUTE 46, MOUNTAIN LAKES, NJ 07046
Tel. (201) 335-2935

Space Plan Not Hot Air

HOUSTON – Scientists are teaming up balloons and minicomputers to develop experimental procedures for use aboard the Space Shuttle.

Nasa researchers are using a Digital Equipment Corp. PDP-8/E connected to an instrument package in a high-altitude balloon by e two-way radio-telemetry link to study cosmic rays.

The balloon's instrument package conducts a series of experiments simultaneously, transmitting data to the computer over the radio link.

The computer analyzes the data and transforms the results into a form of graph on a CRT. When unusual results appear, the researcher has the option of instructing the instrument package, via the radio link, to analyze an experiment more precisely.

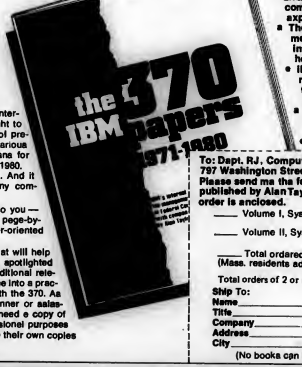
Here's what you always wanted to know about your IBM 370.

Never before has so much confidential information been available to the computer user.

Thanks to actions in Federal Court, IBM's internal papers on its IBM 370 have been brought to light. These "Greybooks" contain a wealth of previously unavailable information on the various models of the 370 — including detailed plans for last year, next year, and every year through 1980. Even IBM salesmen haven't seen more of it. And it can be an invaluable planning tool for any computer installation.

Now these Greybook reports are available to you — in clear, easy-to-read book format — with a page-by-page commentary by the well-known, user-oriented columnist, Alan Taylor.

Almost every page has some information that will help your installation. Alan Taylor's commentary, spotlighted by a specially designed format, provides additional relevant information, and helps make each volume into a practical, useful tool for everyone concerned with the 370. As user, manager, controller, programmer, planner or salesman, there is something here for you. You need a copy of one or more of these books for your professional purposes — and you will want your colleagues to have their own copies so that you can work together.



The facts in these books are fascinating. Among other things they contain are:

- IBM's own analysis of the advantages and disadvantages of 370 models against the competition. (Your Software and Hardware experts both read this information.)
- The descriptions of the planned enchancements for System 370's — and the dates involved. (Your Financial man needs this to help with Rental/Purchase decisions.)
- IBM's plans for the 'death' and replacement of 370 models — and data about their successors. (A unique feature that everyone should read and understand.)
- IBM's use of error-containing hardware for part of the 370 line — hardware that was supposed to be scrapped.
- And much more.

To: Dept. RJ, Computerworld
797 Washington Street, Newton, Mass. 02160
Please send me the following volume(s) of *The IBM 370 Papers*, published by Alan Taylor Associates. Our check or purchase order is enclosed.

____ Volume I, System 370/135 ____ Volume III, System 370/155
____ Volume II, System 370/145 ____ Volume IV, System 370/165

____ Total ordered @ $30 each = total enclosed ____
(Mass. residents add 3% Sales Tax)

Total orders of 2 or more books (or copies) earn a discount of 20%.

Ship To:
Name ____
Title ____
Company ____
Address ____
City ____ State ____ Zip ____
(No books can be sent without check or purchase order)

MIS More Than an Information System—It Must Aid in Decisions

By Don Leavitt
Of the CW Staff

CHICAGO – By itself, an improvement in the supply of information – even a vast improvement – will not improve the management. Speed is immaterial if the information isn't needed in the decision-making process, according to John Reed, executive vice-president of First National City Bank, New York.

Keynoting the fifth annual meeting of the Society for Management Information Systems, Reed said his bank had found, in the seven or eight years it had been working with MIS, that the concepts put forth as the system developed have had a more profound effect on the bank than all the data that had been collected.

The 'Nervous System'

An MIS is – or should be – "the nervous system" of any organization and should grow over time and be sensitive to changes throughout the organization, he explained.

The bank began its formalized MIS planning in 1967, Reed went on, and the original five-man study group now has its own CPU – a 370/155 – in addition to the equipment the DP department uses.

MIS as it evolves is more than an information system: it should help management in deciding where the corporation wants to go, and how to get there.

In that context, he told SMIS, the "data assembly function," the techniques actually used to gather and store information, is of little importance to the decision-makers. But the MIS professional who interfaces between the user/manager and the DP staff has to be an "artist," bringing an intellectual input and his personal focus to the process.

Among the concepts made possible by development of an MIS is a top-down management approach to the setting of targets and goals. Under this concept, top management can propose any goal or targets it feels appropriate and lower management, with the MIS facilities to support it, is required to respond to every suggestion from the top.

This frees the top decision-makers to use their imaginations and come up with bold, new ideas, secure in the knowledge that the ridiculous ones will be "shot down" before they ever become true goals of the bank.

MIS is used in this instance so the junior managers can forecast the future and not just explain the past, Reed continued. The system allows all concerned to better manage the changes that are perceived and that do occur in any organization's operations and environment.

Extracting information from the conventional banking service applications and combining it with input from other sources has allowed the bank to get a much better idea of how well or how poorly it is doing by customer, by "product" (service) and by location, including branches and departments internal to the bank.

She's Good With Numbers, Too

GLASGOW, Scotland – From now on all requests from and messages to your CPU should be addressed to Ms. Computer.

A university professor here has decided that computers are feminine. He based his decision on the fact that computers share many attributes with the female sex.

"They are admired for their configuration," he said, "they have the ability of total recall and correct all our mistakes. They also predict our future foolishness. And, of course, they are always right."

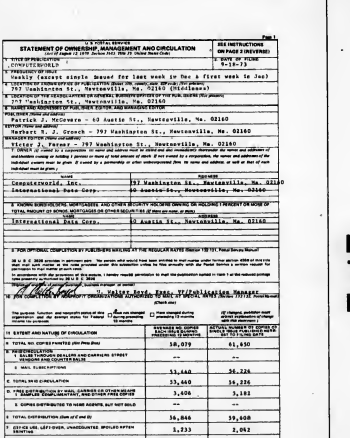
Tired of waiting for reports?

Even this patient fellow appears to be getting a little put out with the slow turnround often associated with a need for reports. If he'd had EASYTRIEVE, the results requested from the computer would have been on his desk within an hour!

EASYTRIEVE is a quick response, simple to learn (written in English) file management and retrieval system.

We'd like to tell you more, because EASYTRIEVE does more!

Call or write:
Pansophic Systems, Incorporated
121 W. 22nd Street • Oak Brook, Illinois 60521 • (312) 325-9600



Page 1

U.S. POSTAL SERVICE
STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION
(Act of August 12, 1970: Section 3685, Title 39, United States Code)

SEE INSTRUCTIONS ON PAGE 2 (REVERSE)

1. TITLE OF PUBLICATION: COMPUTERWORLD
2. DATE OF FILING: 9-18-73
3. FREQUENCY OF ISSUE: Weekly (except single issue for last week in Dec & first week in Jan)
4. LOCATION OF KNOWN OFFICE OF PUBLICATION (Street, city, county, state, ZIP Code) (Not printers): 797 Washington St., Newtonville, Ma. 02160 (Middlesex)
5. LOCATION OF THE HEADQUARTERS OR GENERAL BUSINESS OFFICES OF THE PUBLISHERS (Not printers): 797 Washington St., Newtonville, Ma. 02160
6. NAMES AND ADDRESSES OF PUBLISHER, EDITOR, AND MANAGING EDITOR
PUBLISHER (Name and address): Patrick J. McGovern - 40 Austin St., Newtonville, Ma. 02160
EDITOR (Name and address): Herbert W. J. Crosch - 797 Washington St., Newtonville, Ma. 02160
MANAGING EDITOR (Name and address): Victor J. Farzey - 797 Washington St., Newtonville, Ma. 02160
7. OWNER (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given.)

NAME	ADDRESS
Computerworld, Inc.	797 Washington St., Newtonville, Ma. 02160
International Data Corp.	40 Austin St., Newtonville, Ma. 02160

8. KNOWN BONDHOLDERS, MORTGAGEES, AND OTHER SECURITY HOLDERS OWNING OR HOLDING 1 PERCENT OR MORE OF TOTAL AMOUNT OF BONDS, MORTGAGES OR OTHER SECURITIES (If there are none, so state)

NAME	ADDRESS
International Data Corp.	40 Austin St., Newtonville, Ma. 02160

9. FOR OPTIONAL COMPLETION BY PUBLISHERS MAILING AT THE REGULAR RATES (Section 132.121, Postal Service Manual)

39 U.S.C. 3626 provides in pertinent part, "The person entitled second class been entitled to mail copies under former section 4359 of this title must file such form a year after the date on which he first became entitled to mail copies under this subsection unless he shall publish within one year thereafter a written request for continued qualification therefor."

In accordance with the provisions of this statute, I hereby request permission to mail the publication named in Item 1 at the reduced postage rates presently authorized by 39 U.S.C. 3626.

Signature and title of editor, publisher, business manager, or owner: Patrick J. McGovern - Chairman of the Board, Exec. Vice-President & Treasurer

10. FOR COMPLETION BY NONPROFIT ORGANIZATIONS AUTHORIZED TO MAIL UNDER SECTION 3626 (Check one)
The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes
(1) Have not changed during preceding 12 months
(2) Have changed during preceding 12 months
(If changed, publisher must submit explanation of change with this statement.)

11. EXTENT AND NATURE OF CIRCULATION	AVERAGE NO. COPIES EACH ISSUE DURING PRECEDING 12 MONTHS	ACTUAL NUMBER OF COPIES OF SINGLE ISSUE PUBLISHED NEAREST TO FILING DATE
A. TOTAL NO. COPIES PRINTED (Net Press Run)	58,079	61,650
B. PAID CIRCULATION: 1. SALES THROUGH DEALERS AND CARRIERS, STREET VENDORS AND COUNTER SALES	--	--
2. MAIL SUBSCRIPTIONS	53,440	56,226
C. TOTAL PAID CIRCULATION	53,440	56,226
D. FREE DISTRIBUTION BY MAIL, CARRIER OR OTHER MEANS: SAMPLES, COMPLIMENTARY, AND OTHER FREE COPIES	3,404	3,182
E. COPIES DISTRIBUTED TO NEWS AGENTS, BUT NOT SOLD	--	--
F. TOTAL DISTRIBUTION (Sum of C and D)	56,844	59,408
G. OFFICE USE, LEFT OVER, UNACCOUNTED, SPOILED AFTER PRINTING	1,233	2,052
H. TOTAL (Sum of E & F—should equal net press run shown in A)	58,079	61,650

I certify that the statements made by me above are correct and complete. (Signature of editor, publisher, business manager, or owner) Patrick J. McGovern

PS Form 3526 July 1971

Boole Babbage

Put Us On The Spot . . . If You Are!

If you are considering configuration changes or program optimization—call us.

We invented the word measurement . . . and the business.

Boole & Babbage develops and markets Systems Measurement Software for OS, DOS, and now for VS.

Our software measures systems, programs, and hardware configurations . . . reduces costs because your applications run better and faster . . . typically 30 to 40% better and faster.

Call or write the Leaders in Computer Performance/Measurement Products and Services for additional information on:
Computer Performance Monitoring;
User Job Accounting and Systems Statistics;
Data Set Optimizing; Program Optimizing;
and Tape Library Control.

Boole & Babbage, Inc.
850 Stewart Drive
Sunnyvale, CA 94086
408/735-9550

Name _____
Title _____
Address _____
City _____ State _____ Zip _____
Telephone ( ) _____

Editorials

Murphy's Law Revisited

In their haste to protect individual rights, Iowa legislators have apparently passed a law permitting secret arrests.

Originally hailed as a model for protecting privacy, the Iowa law controlling computerized crime information was interpreted by police officials as prohibiting the release of all current arrest information.

Attorney General Richard Turnar correctly assessed the situation when he called it a "classic example of carelessness in legislative drafting." Fortunately, he also ordered a halt to the secret arrests, and to the practice of "dissemination of arrest records of the innocent, but not the guilty."

Whether this is an example of Murphy's law (anything that can go wrong will go wrong) or of sabotage by literal interpretation of policy is uncertain. But worse yet, things won't change until the legislature is convened next March.

The attorney general's ruling plugs one hole in this law, but others might be found. And even worse is the uncertainty over the success of the next version, or the likelihood that other existing laws will be proven ineffectual or inaccurate.

If, as the story suggested, the resistance to the new law was part of the reason behind the "misinterpretation," then we await future developments with trepidation.

Really a Coincidence?

The Data Processing Management Association ennounced a rare profit at the same time it announced indecision on whether it wants to join the American Federation of Information Processing Societies.

Coincidence or cause/effect?

The ramifications of becoming an Afips member are both political and economic, for the future of DPMA's conference could be in question. And DPMA has apparently credited this year's annual conference as one of the chief reasons for its first profiteble year in four years.

It's time to take the bull by the horns. We see Afips membership as a plus for DPMA and for the user community. The move would also "legelize" Afips es the total voice of the computer community.

What's the holdup?

Santiago, Moscow and Ottawa

September was international month for me, intellectually and professionally at any rate. It also was the month I moved my family and my possessions (read, "encumbrances"!) north to Bean/Cod Country. Most of said encumbrances, anyhow: seven sofa cushions and my brand new leather overcoat, Warmer von Brown, are still en *route*. I hope!

First international item was the Chilean takeover. I have been corresponding with contacts in Santiago and in Buenos Aires about the Stafford Beer story – whether Chile was really being guided economically by a computer system.

In the long run, we may have better access than under the Allende regime, and a clearer answer about that mysterious control room. But for the moment, we're cut off. And journalism aside, I hate to see another military junta in Latin America; ugly and restrictive though the socialist regimes may be, they don't pillage like the Perons or torture like the generals.

Then came the cables from the Academy of Sciences to the Soviet academy. Wow! For once, some gutsy action from one of the most ingrown and neutered societies on the national scene. They never would have done it under Fred Seitz; bravo, Handler – bravo, Harrison Brown!

For those happy Middle Westerners whose papers don't carry such stories – hello, Indianapolis! – what our usually smug and somnolent scientists did was to send two cables to the Russians saying, "Lay off Sakharov and Solzhenitsyn, you lunks, or we won't tell you what's inside the 7600!" Absolutely great, and the more so considering the source.

If there is to be substantial non-mercantile technical cooperation between the Soviets and ourselves, it will be channeled largely through the two academies. Theirs is completely the tool of the regime; ours, happily, is not.

And finally, I'm writing this in Ottawa. After a Black Hat scene in Santiago and a White-Hats-Are-Trying scene in Washington/Moscow, it's nice to be immersed in the clear air of Canada and the informal good will of ICA people. This is the Intergovernmental Council for ADP, a club of senior central-government computer people from 17 countries. The chairman is French, the vice-chairman Dutch, the secretary-general Israeli; we had members from Australia, Japan and Korea as well as North Americans and Europeans. Good vibrations! (I get to go as an ex-officer, not as a journalist – which I'm not much of yet anyhow.) Attention was focused on the new Canadian EDP Master Plan, which is up for approval in the higher reaches of the government.

Without getting into detail, or saying too much too soon, it is probably OK to call it a plan for centralization; three kinds of centers are proposed – departmental, functional and service-wide application. The defense people will have one of the first; resources and environment people in several departments will share one of the second; a personnel management information system like the Australian Mandata system will be one of the third. And telecommunications, where the Canadians are conspicuously advanced, is being taken into account all down the line.

The Ontario provincial government also has a master plan, and it focuses on a rather different aspect. Instead of attempting to control its computer installations and people and suppliers at the procurement point, as the Brooks Bill tried to do in Washington, the Ontario idea is to cost out the internal operations in full, with startup costs and training expenses and "marketing," and let private contractors bid on the same services. My estimate was that the public service operations would have about a 30% edge over the private sector (10%, profits not required; 20%, greatly reduced proposal costs), which seems about right to overcome their inflexibility in compensation and recruiting, and general government goopiness.

Next week, Amsterdam and London.

Herb Grosch

Letters to the Editor

Give Mini Credit – It Does Fill a Gap

Warren J. Sharp [CW, Sept. 19] may be a director of marketing, but he obviously has not done his homework on the mini, or else is talking in specific terms about the wrong market. The advantages of the mini are self-evident, and place it in a market untouched by the super-computers.

Firms that can justify annual data processing costs of up to $150,000 should well look at the vast variety of minis on the market. Sharp seems to think these companies are interested in high-volume, high-speed output.

I contend that most of these potential users would more likely be in a multiple, low volume-per-file environment. After all, what is the average number of accounts receivable and payable for a firm of this size? And what applications are likely to be implemented on the first mini? Surely not forecasting, modeling, and other abstract, advanced systems. The bread and butter work of accounts receivable, payables, inventory, payroll and job costing is going to be first.

For $1,200/mo, several minis offer a 16K processor with several software languages; one to two spindle disk drives with capacities beyond 10M bytes; CRT control terminal with interactive operating system; and 60 line/min impact printers capable of multiple copies.

For a few dollars more, tape drives, additional disk drives and faster printers can be had. Say, for a top-notch state-of-the-art mini computer system, $2,000/mo.

Let's see the cost figures on that IBM 370/155. And, as Sharp would discover if he were to investigate a few mini manufacturers, they can, indeed, do nearly anything his 370 can. (Perhaps not as fast as the 370, but at bicycle prices he expects Indy 500 speeds?)

Sharp may possibly be overstating the requirements of the medium-scale firm interested in a mini. Their needs involve a system that can handle a foreseeable workload.

Few companies experience bursts of growth that would overload a computer underloaded last year, and if they did, they could afford to upgrade. His concern over the obsolescence of a mini is misplaced. Minis do not have a notorious wear-out rate.

In fact, they have the highest reliability factors in the industry. If the mini can handle a firm's needs at 30% to 50% capacity now, it is not unreasonable to assume that five years from now the mini might not yet be saturated. And, in most cases, minis are upgradable to higher-speed processors.

In addition, if the workload grows more rapidly, why not run two minis, which not only doubles the capacity, but provides an on-site backup for critical processing in case of a failure.

Perhaps Sharp's most serious error is in estimating the printout requirements in a system.

To assume one line of printed output for each item input (be it card, record, etc.) as the industry average is ridiculous! Exception reporting, summary reports, on-line file inquiry and microfiche output have revolutionized the mini-computer market.

Few executives still need the 12-in.-thick detail listings as security that the computer is working. At 250 line/min, probably the fastest inexpensive impact printer limit, over half-a-million lines are possible in a 40-hour week. And video-tubes relieve a great deal of this load for file inquiry, program development and testing. The old concept of "card input, line output" is just that – old.

Let's give the mini credit. It fills a gap for the industry. It's not meant to be the fastest thing on transistors. It is merely a greatly scaled-down piece of equipment for those who have no need for more. And, though it is scaled down, the processing capabilities are still incredible.

Kenneth Patrick
Analyst/Programmer
Southern Illinois University
Carbondale, Ill.

More Most Than Bones

The CI Notes section in the Sept. 12 issue claims that Interdata plans to introduce two new minicomputers to compete with our Nova 2 line. You referred to the Nova 2 as a "bare bones" machine. That is not true.

The Nova 2 is a 16-bit parallel central processor, with a 16-level interrupt structure, a direct memory access data channel, a chassis, power supply and full programmer's console and an external I/O bus connector.

Both Nova 2 models are available with up to 32K words of memory, and can support our Real Time Disk Operating System.

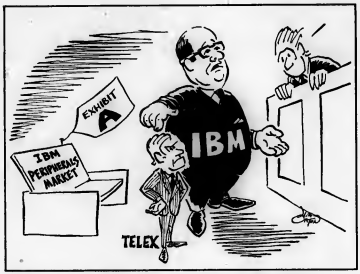
They support all the peripherals Data General offers, and they run all Data General software. Nova 2s can do anything any other Nova-line computer (except the Nova 840) can do.

Stephen J. Gaal
Marketing Manager
Processor Products
Data General Corp.
Southboro, Mass.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

THE DECISION: Winners but Losers?

by Jim Orton

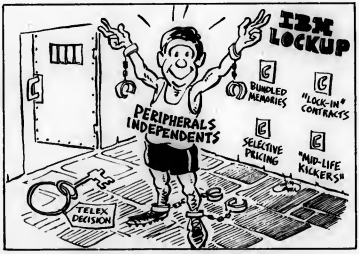


'I Had to Crowd Him, He'd Have Taken Up the Whole Beach!'

'Sure It's a Good Thieg—for Bargain Hunters...'

'Mostly It (Ouch) Went Pretty Well...'

Style Setter



Back in the Running

Backlash?

HOW MANY OF THESE COMPUTER BOOKS ARE IN YOUR PERSONAL LIBRARY?

(retail prices shown)

40621. COMPUTERS: Auditing and Control. *Edited by Elsie G. Jancura and Harold R. Berger.* Details every aspect of computer control, data security and the evaluation of the results of computerized activities. **$14.95**

62961. TECHNIQUES FOR DIRECT ACCESS. *Keith R. London.* This authoritative work gives readers at every level of experience a well-rounded appreciation of direct access devices and what they do. **$14.95**

50460. GPSS PRIMER. *Stanley Greenberg.* GPSS is an application-oriented (rather than machine-oriented) simulation language which features an elaborate software package. Shows when, where and how to use GPSS. **$14.50**

41791. DECISION TABLES. *Keith R. London.* Puts the decision table in its proper perspective—as a tool for facilitating communication between individuals and between individuals and machines. **$12.50**

39940. COMPUTERS, SYSTEM SCIENCE, AND EVOLVING SOCIETY. *Harold Sackman.* The origins, historical development, social implications, and potential for scientific planning and control of human affairs of the computer revolution. **$17.95**

33420. THE ANALYSIS OF INFORMATION SYSTEMS. Revised Edition. *Charles T. Meadow.* An all-inclusive treatment of the four aspects of information processing and retrieval. **$14.95**

04200. 360/370 PROGRAMMING IN ASSEMBLY LANGUAGE. *Ned Chapin.* The language, techniques and methods of programming the 360/370 families of computers. Covers arithmetic operations, input, output, job control, debugging, data manipulation. **$13.50**

70751. PROGRAMMING TIME-SHARED COMPUTERS IN BASIC. *Paul Dickinson.* A easy introduction to time-sharing and to BASIC. Also applications in business, industry, science and research. **$10.95**

39060. COMPUTER HARDWARE THEORY. *W. J. Poppelbaum.* A system introduction to the theory used in designing computers and their input/output equipment. **$16.50**

42281. DIGITAL COMPUTING AND NUMERICAL METHODS. *Bruce Carnahan and James O. Wilkes.* A brilliant presentation of numerical methods with practical application to their implementation on digital computers. **$13.50**

55510. OPERATING SYSTEMS. *Harry Katzan, Jr.* The first all-inclusive coverage of operating systems technology, their structure and utilization to functions and operations. **$14.95**

30580. THE BEST COMPUTER PAPERS OF 1971. *Edited by O. R. Petrocelli.* Prize-winning papers from the Association for Computer Machinery, International Federation for Information Processing, Institute of Electrical and Electronics Engineers, Numerical Control Society, etc. **$12.50**

55401. PL/I PROGRAMMING. *John K. Hughes.* No better introduction to this unique programming language. **$12.95**

36861. THE COMPUTER FROM PASCAL TO VON NEUMANN. *Herman H. Goldstine.* One of the world's leading mathematicians describes the development of the computer. By one of the "fathers" of this twentieth century miracle. **$12.50**

64370. TOTAL SYSTEM DEVELOPMENT FOR INFORMATION SYSTEMS. *Frank G. Kirk.* A practical guide to the development of information systems. **$14.95**

42371. DIGITAL SYSTEMS: Hardware Organization and Design. *Frederick J. Hill and Gerald R. Peterson.* Analytical approach to computer organization and digital system design. Covers hardware, software, microprogramming, inter-system communications, etc. **$17.95**

40100. COMPUTER SEMANTICS: Algorithms, Processors and Languages. *John A. N. Lee.* Brilliant extension of computer semantics. Bridges the No Man's Land between the computer as a practical working tool and as an abstract theoretical machine. **$19.50**

PICK ANY 3 THAT YOU DON'T HAVE FOR ONLY $3.95

values as high as $52.85

as a member of

THE LIBRARY OF COMPUTER AND INFORMATION SCIENCES

(You simply agree to accept 3 more books—at handsome discount—over the next 12 months.)

HOW THE CLUB OPERATES

• The Book Club News, describing the coming Main and Alternate Selections, will be sent to you 15 times a year at three to four week intervals. • If you wish to purchase the Main Selection, do nothing and it will be shipped to you automatically. • If you prefer one of the Alternates, or no book at all, simply indicate your decision on the reply form always enclosed with the News and mail it so we receive it by the date specified. • The News is mailed in time to allow you at least 10 days to decide if you want the coming Main Selection. If, because of late mail delivery of the News, you should ever receive a Main Selection without having had the 10-day consideration period, that Selection may be returned at Club expense. • After completing your trial membership, you will be entitled to take advantage of our bonus plan offering savings up to 70% and more. (Offer good in Continental U.S. and Canada. Prices slightly higher in Canada.)

Choose from books on Hardware Theory • Software Packages • Microprogramming • Data Security and Manipulation • Access Devices • Electro-optics • and much more.

One book club—and only one—helps you keep tuned to the explosive changes in computer science. Ours. With books that talk a certain language. Yours. Books on programming. Software. Hardware. Theory. Management and management uses of the computer. Only the most advanced, most significant, more informative books—as they are published.

To help you keep up, in terms of career advancement and cold, hard cash. Substantial discounts, too, in an area where books are rarely—if ever—discounted. Why not join us—and see for yourself.

The Library of Computer and Information Sciences 7-29T
Riverside, New Jersey 08075

Please accept my application for membership and send me the three volumes indicated. Billing me only $3.95 for all three. I agree to purchase at least three additional Selections or Alternates during the first year. I am a member of special members' prices. Savings range up to 30% and occasionally even more. my membership is cancelable any time after I buy three additional books. Shipping and handling charge is added to all shipments.

3 books for $3.95

Indicate by number the 3 books you want.

Send no money. Members are billed when books arrive.

Name.....

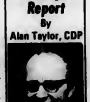
Address.....

City..... State..... Zip

Book selections purchased for professional purposes may be a tax-deductible expense.

Have IBM's Methods Hurt Users and Professionals?

The Taylor Report
By
Alan Taylor, CDP



The most important computer news in the national press this month has, of course, been the Telex-IBM decision. In it Judge A. Sherman Christensen calculated that one comparatively small corporation in one peripheral area had been illegally damaged by IBM's actions to the extent of over $100 million. He also noted Telex had been indulging in illegal practices, and fined it $21.9 million.

All this news, with its resulting financial implications, makes good grist for the lay press.

But the more important issue relates to computer users and computer professionals generally. How have they fared? Have they lost anything as a result of this atmosphere of corporate illegality? That is the urgent question which can no longer be responsibly side-stepped by information professionals.

User Loses in Two Ways

Computer users seem to have lost in two ways since IBM took over computer-industry leadership in the fifties. If the facts found by the judge are correct, users seem to have lost the opportunity to have better peripherals provided by substantial competitors. Users also seem to have simultaneously lost the opportunity to have cheaper peripherals than IBM would provide – while possibly any apparent low cost of peripherals, because of IBM price cuts, may have been offset by price increases in central processors.

This is a serious matter, one which can cause users financial problems, and consequent corner-cutting which tends to lessen quality control. And quality is something information systems urgently need if they are to be reliable.

Responsibility for reliable systems, of course, lies with information professionals. By being deprived of budgets and the access to competitive ideas and services, professionals had obviously been hurt just as much as users who rely on the professionals.

But professionals may have been hurt even more by the general atmosphere of illegal behavior which apparently is admitted to exist in the DP supply industry. (Computers are only a supply, just like paper, from the point of view of an information professional.)

> *"Since IBM took over the leadership of the industry in the late fifties, we have lost the path to real information professionalism, and this is what really hurts user and professional alike."*

I suspect herein lies the greatest loss to the user and professional: they have accepted an atmosphere of basic irresponsibility as natural – not as something to be denounced vigorously whenever it dared raise its head. Moreover, there appears solid evidence supporting my position – evidence which should not be ignored.

Allows 'Decommitments'

The basic attitude of IBM permits the practice of breaking commitments without expecting to make full recompense to those who rely upon its commitments, and this is perhaps best illustrated by the word "decommit."

This was previously used to describe some assumed right to withdraw from inconvenient promises, but was originated by IBM in the middle sixties.

If anyone cares, at a professional level, about information reliability, then the word and its use by a major part of the profession are dangerous. So also is the attitude of the corporation and its employees where such thinking is encouraged.

Consider IBM when it joins various professional bodies. IBM is, for instance, a perfectly proper company member of the American National Standards Institute, and is therefore expected to support the Ansi rules.

One of the Ansi rules is that companies shall not be given representation upon Ansi committees where there is an industry body available to which it belongs, and which has standardization activities.

IBM belongs to not one, but two such bodies, both of which (ACM and Cbema) have standardization activities. But both IBM and these bodies continue to sit and vote on the X3 Committee, thus making a mockery of the Ansi assurances of proper balance in standards.

Another professionally important body is the Conference on Data Systems Languages. Codasyl controls the changes in Cobol and can obsolete current forms of Cobol prematurely – just as IBM has planned to obsolete System 370 prematurely.

Codasyl membership is reserved, by its constitution, for individuals. This same denial of membership rights to corporations is a prominent part of the Codasyl letterhead.

One Codasyl officer told me this was deliberate to avoid charges of collaboration between competing manufacturers.

Despite this, IBM maintains membership in Codasyl in its own name. The promises on the letterhead and in the constitution appear simply to be "decommitted" – they can continue to be used without disturbing the professional consciences of the professionals who have to associate with IBM on the committee.

Again we see the intrusion of unreliability of information into the centers of information professionalism.

Even in Societies

The influence of IBM can even be seen in our professional societies. The Association for Computing Machinery (perhaps only central processors and one-armed bandits should be allowed to join) includes IBM among its corporate members (at $1,000 per corporation). However, the ACM constitution does not permit IBM to exert any direct influence on society decisions. The constitution of the society reserves all important decisions for the individual membership. Even the executive council is supposed to refer any important matter to members.

But historically the executive council does no such thing. Time after time decisions which are obviously important are made by the council either without the membership being allowed to effectively participate in its constitutionally protected role, or even in complete defiance of member wishes – as occurred recently in enforcement of professional ethics.

In these matters IBM employees have exerted considerable influence over the executive council – often sitting as president, vice-president or other such influential positions and creating policy which is supposed to be reserved for the in-

(Continued on Page 12)

If you want the BEST audio-visual edp TRAINING SYSTEM

Get it from edutronics!

The EDUTRONICS TOTAL SYSTEMS APPROACH is simply the best audio-visual EDP training system available. Why? Because with it thousands of EDP professionals, from programmers through top management, have learned and developed their skills more effectively than with other methods.
They've discovered that our full-color videotapes and films, study guides, workbooks and other materials are effective. And make learning more enjoyable.
They've also discovered that the EDUTRONICS TOTAL SYSTEMS APPROACH can be used anywhere for any length of time by anyone regardless of specialization, corporate position or economic justification.
Discover what Edutronics can do for your company. Call or write for a demonstration today.

edutronics
systems international, inc.
Lakeside Office Park, Wakefield, Mass. 01880
(617) 246-0914

Boston (617) 245-6960	Dallas (214) 233-9166	Los Angeles (213) 380-7811	San Francisco (415) 969-0417	Washington, D.C. (202) 223-2614
Chicago (312) 787-1722	Kansas City (816) 756-0400	New York (212) 421-4610	Toronto (416) 484-1992	Winnipeg (204) 786-1434

also in London and Paris

A Coleman American Company

Professional Practices

Perot's EDS Service Called 'Exemplary,' 'Inexcusable'

In the Aug. 22 issue, Norman P. Kelly, president of National Time Sharing & Data Services, Inc., Buffalo, N.Y., questioned the professionalism of various reported aspects of medicare handling by Electronic Data Systems of Dallas. What follow here are two other views of the matter.

One letter, written in response to Kelly's article, is from the chief executive officer of California Blue Shield. The other, written before the Kelly article was published, is from the president of a local California medical society detailing his efforts to obtain payment checks from California Blue Shield.

Comments on matters of professional practice as revealed in these letters, or in the original Kelly article, are welcomed, and should be addressed to Alan Taylor, c/o the Professional Practices Page, Computerworld, 797 Washington St., Newton, Mass. 02160.

Cheers From Blue Shield

First of all, I would like to say I am not a regular reader of *Computerworld*, and the issue of Aug. 22 came to my attention because of Norman Kelly's blast at EDS. Frankly, I was astounded that *CW* would print such an article because it obviously smacks of sour grapes.

Either Kelly is a disgruntled former EDS employee or an unsuccessful bidder against EDS. Otherwise he would not have written such an article with so many misstatements of fact which appear to be quite intentional.

Blue Shield of California still may be the largest user of EDS computer services. We hired EDS in 1969 for a very good reason, simply because we could not get what we needed from our in-house operation.

Since hiring EDS, Blue Shield of California has developed an exemplary performance in Medicare administration which is rated high among all categories of measurement with other carriers. Performance equal to this achievement has been obtained in our administration of California's Champus program, and our private standard business.

We are truly more competitive today than at any time in the history of this corporation, and a fair share of this success is a result of the efforts of EDS in the supply of data processing services.

Ordinarily, I would ignore the type of article written by Kelly as just another crank ventilating his spleen. However, in this case, because it was so blatant with inaccuracies, I felt compelled to put EDS' computer operation, with regard to this company at least, in the proper perspective.

Thomas C. Paton
President, California Blue Shield
Los Angeles, Calif.

A biographical note to Kelly's letter called attention to the fact that his company had protested EDS contracts in the past, and that he had protested the rejection of his own company's bids in various federal contracts. He is, indeed, an EDS competitor.

This letter by Paton is printed in its entirety, and we invite substantiation of the charges that Kelly's letter was blatant with inaccuracies. Ed.

'Simple Computer Error'

Alan Taylor's columns concerning the problems of the public with computer billing services are most interesting. Here's a true story that happened to one of the physicians in this area.

He asked me to help him with a serious problem in his medical office billing, and as I was personally acquainted with some of the political "powers" in the organization concerned, I was successful. But on his own, he could get nowhere.

Some time ago, a well-known surgeon from our community noted he was no longer receiving payment checks from California Blue Shield. The data processing for California Blue Shield is done by Electronic Data Services (sic) of Dallas. This corporation is controlled by Ross Perot.

The physician, after a two-month delay, started calling the field representatives of California Blue Shield and wrote them numerous letters. He was finally informed the computer no longer had a correct address for him.

He was told a check that had been mailed to him had been returned to California Blue Shield with the notation "not at this address." This was duly entered on the computer and therefore no further checks could be sent to him. This was in spite of the fact that he was continuing to bill the group regularly.

He was assured the matter would be taken care of, but it was not, and after another month's delay, he came to me in desperation, as I was president of the local county medical society.

It is obvious the post office made a mistake in delivering the check, but the actions of the insurance company and the computer people was completely inexcusable.

In answer to his questions, however, he was told it was a "simple computer error."

My example, in a sense, is similar to the problem Taylor discussed in his column of March 7, 1973, where another person's name was linked with her correct address resulting in her apparent liability for another person's bill.

M.D.
Name Withheld by Request

This letter is printed in its entirety, with the exception of the background material that established the doctor's credentials but which would have revealed his identity. Ed.

the Giant KiLER!

micos

Has IBM Hurt Users?

(Continued from Page 11)

dividual membership. Effectively, they have "decommitted" the ACM constitution — right in the heart of information professionalism.

The list could go on. But the IBM-Telex decision showed that both sides, in the opinion of a judge, had acted improperly.

How far have such actions taken our profession away from the basic concept of providers of reliable information systems?

Since IBM took over the leadership of the industry in the late fifties, we have lost the path to real information professionalism, and this is what really hurts user and professional alike.

© Copyright 1973 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for non-commercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of Computerworld.

Get the news when it happens, not when it happens to get to you.

Please send me **COMPUTERWORLD** for 1 year and bill me later.

☐ U.S. – $9 ☐ Canada – $10 ☐ Other foreign – $25

First Initial	Middle Initial	Surname	
Your Title			T – 340
Company Name			
Send to: Address			
City		State	Zip Code

Address shown is:
☐ Business
☐ Home

☐ Check here if you do not wish to receive promotional mail from *Computerworld*.

COMPUTERWORLD

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

YOUR INDUSTRY

01 Mining/Construction/ Oil & Refining
02 Manufacturing – Computer or data system hardware/peripherals/other associated mechanical devices
03 Manufacturing (other)
04 Utilities/Comm. Sys./Transportation
05 Wholesale/Retail
06 Finance/Insurance/Real Estate
07 DP Serv. Bureau/Software/Planning
08 Business Services (except DP)
09 Education/Medical/Legal
10 Federal, State and Local Government
12 Communications/Printing/Publishing
13 Other:_____

YOUR FUNCTION

01 Corporate Officer
02 Data Processing & Operational Management
03 Data Processing Professional Staff
04 Consultant
05 Lawyer/Accountant
06 Engineering-Management/Scientific/R&D
07 Sales/Marketing/Account Executive
08 Librarian/Educator/Student
09 Other:_____

FIRST CLASS
PERMIT NO. 40760
NEWTON, MASS.

BUSINESS REPLY MAIL No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

797 Washington Street
Newton, Massachusetts 02160

SOFTWARE&SERVICES

Random Notes

Free CICS Reference Card Shows Parameter Formats

HACKENSACK, N.J. – A 10-panel pocket-sized CICS Reference Card is available free from On-Line Software, Inc. to installations using the IBM teleprocessing support system.

The programming aid shows the format of many CICS parameters and the internal routine names to which they are related. It also lists storage areas, their symbolic names and symbolic base addresses; graphic layouts of the common control communications area and of storage chains; messages and dump codes and return codes.

The company is at 411 Hackensack Ave., 07601.

Real-Time Processes Monitored

LEXINGTON, Mass. – Real-time process monitoring on a DEC PDP-11 operating under the RSTS environment is possible with the Labx software now available from Evans Griffiths & Hart, Inc. Real-time response delays are described as "typical of the time-sharing system's response to a human user at a terminal."

Labx real-time programs are written in Basic, the standard RSTS language. The system uses DEC's Laboratory Peripheral System (LPS-11) as the hardware interface with the real-time environment.

Labx requires a minimum 12,50 words of memory and costs $1,000. The firm is at 1844 Massachusetts Ave., 02173.

Service Offers TV Ad Control

NEW YORK – The Raamedia remote-computing service from Raam Information Services Corp. provides advertisers and advertising agencies a system of planning, placement and control of spot TV advertisements for every U.S. market.

The subscriber uses a CRT terminal, entering goals, spot buys and invoices for any number of TV media campaigns. The collected data is available for review and analysis.

Raam is at 888 Seventh Ave., 10019.

On-Line Accounting In Honolulu

HONOLULU – Federal credit unions throughout the Hawaiian Islands can now have their accounting handled on-line through the Burroughs B4700-backed facility of Southeast Asia Computer Associates (Seaca). Terminals at local credit union offices will be tied to the central CPU by phone lines.

The service will be extended to state-chartered credit unions by July, 1974, a company spokesman added. Room Suite 306, in the Amfac Building, 96813.

Correction

Gambit, Inc., publisher of The Computer Survival Handbook (CW, Sept. 26), is at 53 Beacon St., Boston, Mass. 02108.

How to Evaluate Software

Know the Proposed Package's Purpose

By Don Leavitt
Of the CW Staff

CHICAGO – "Think and act like the management people you're supposed to be" – was the plea of software vendors speaking to a Buyers Workshop sponsored here recently by International Computer Programs, Inc., publishers of the *ICP Quarterly*.

Buyers should know enough about whatever package they are considering so they know why they are considering it, Warren Luke, vice-president of Pansophic Systems, Inc., said in starting the discussion. "You should consider three things: what it does, how well it is documented and how well it is supported," he added.

DP managers generally shirk their duty when evaluating proposed purchases, he charged.

While talking to the vendor, they agree that the proposed package apparently will fulfill a specific need. But then they turn the package over to a subordinate for a detailed evaluation, without any sort of checklist based on the talks.

Left to their own devices, the evaluators generally come up with very negative reports about features that are irrelevant to the manager's intended purpose, Luke noted.

Talk with current users of the package being considered, he urged, and also recognize that the vendor's support will probably be heavier during the trial period than it will be after acceptance.

Vice-president Ron Davis of Applied Data Research, Inc. had the same basic message. He urged the users to develop an understanding in five areas. Before acquiring a package – just as they would before starting an in-house development project – they should have an evaluation and implementation plan. They should have a set procurement procedure so that both vendor and user know who is really responsible for the final go/no go decision.

Users should realize the difference between contractual terms dealing with the substance of the software, and any consideration of the financing terms. Most software houses have a variety of payment plans, but they have to have firm prices.

Plans for delivery by the vendor and acceptance procedures by the buyer should be formalized, and maintenance and warranty terms should be clearly understood by both parties before any acquisition, Davis said.

President F.L. Schlegel of Management and Computer Service, Inc. urged attendees to "have an evaluation acquisition plan and let us know what it is. Act like businessmen. We have to, to survive, and we can meet your needs – or see that we can't meet them – a lot easier if both of us know what those needs are."

Vice-president Phil Matheny of Programming Methods, Inc., urged that once a package is brought in, the user should assign someone – on a continuing basis – to make sure the product is used. It's not doing anyone any good sitting on the shelf, he noted, "if you're unhappy about the package, tell us."

Art Lyon, district sales manager for Infonational, said it saves time – and therefore money – for all concerned, if the user can provide a clear understanding of his needs at the start of any discussions.

If a product is taken in-house, don't violate the vendor's proprietary rights to it, he went on.

If you don't know how to set up an evaluation, Informatics' John Splavec added, ask the vendors how to do it. Even if each suggest an approach that would put his product in an especially good light, a synthesis of all the plans should overcome such biases.

Payroll System 'File Dictionary' Lets Users Define Master Files

ROCHESTER, N.Y. – A "file dictionary" capability built into the Payroll/Personnel System from Informatics Associates, Inc. (IAI) allows IBM 360/370 users to define their own master file and maintenance transaction formats.

This flexible interface is matched, within the system, by "floating fields" for employee taxes, deductions and benefits, and a suspense routine that edits future changes and stores them until they are to be put into effect.

The system also includes a global change feature so groups of records can be changed in a single pass with a single input.

Employee records contain a variable number of fixed-length segments, omitting those segments that are inappropriate for each individual employee. This file design, IAI claims, lends itself to teleprocessing, allowing on-line inquiry into every part of the master records.

The payroll portion of the package handles all the conventional processing of any comparable system. The personnel section can be used to build up a data base, and separately priced labor distribution, manpower allocation and generalized retrieval facilities are available to work with the system.

The generalized retrieval subsystem works with this package but is equally useful for other applications as well, IAI noted.

The entire package is written in ANS Cobol. It requires a 54K partition under DOS and 90K under OS. The basic application logic is available for $25,000. Labor Distribution costs $5,800 and Manpower Allocation, $4,200. The Retrieval option can be acquired for $9,500.

IAI is at 20 N. Union St., 14607.

Seminar Focuses on DP Auditing

LOS ANGELES – A three-day seminar, combining lectures, discussions, case studies and situational analysis, has been developed by Unicorn Systems Co. to familiarize accountants, auditors and DP personnel with techniques needed to audit existing DP systems. The course is also designed to help improve the validity of existing systems and plan for the auditing requirements of new applications.

Unicorn feels that auditing requirements and the management approaches they may imply, vary enough from one organization to another so that each presentation of the seminar is limited to a select number of participants, all of whom must be from the same company.

Participants are expected to have "substantial knowledge" in accounting, programming (including systems design), or computer operations management. The seminar should be considered as advanced training, Unicorn warned, and is not designed to teach or review basic accounting, basic DP or operational fundamentals.

The seminars are limited to no fewer than five people, but no more than 10. Because the auditing interests and experiences of any group are diverse, Unicorn requires that all attendees at a given presentation be from the same basic discipline. This, the company said, will avoid redundant instruction that would otherwise be needed to bring all students up to the same level.

The seminars are conducted at Unicorn's offices, 3807 Wilshire Blvd., here in Los Angeles on three successive days, and run from 9 a.m. to 5 p.m. To get everything done within the three days, participants are expected to complete homework assignments.

Fee for the seminar is $3,000 with up to 10 participants which includes all material distributed during the seminar and lunch on all three days.

Nobody Schedules Multiprogramming the Maximum Advantage Way... Except Our Customers

Value Computing's customers have a tool, our Scheduling System, in the hands of their schedulers that pays off big. With Value Computing, schedulers don't just schedule, they also optimize the loading and balance of the entire computer system. Benefits frequently experienced are:

- productivity increases of 20-40%
- savings of hundreds of thousands of dollars
- improved operational control
- better service to customers
- a new ability to plan ahead
- new tools for measuring people and system productivity
- lots more

If you want these benefits, you have a responsibility to fill out and mail this Value-able coupon.

Value Computing Inc.
496 Kings Highway North
Cherry Hill, New Jersey 08034

Scheduling Tools for
OS/MFT and VS1
OS/MVT and VS2
DOS and DOS/VS

Value Computing Inc.
496 Kings Highway North
Cherry Hill, New Jersey 08034
I'm interested in More Details:
☐ About Your Computer Scheduling Systems
☐ Have a Salesman Call
☐ I Don't Believe You, But I'll Listen
Name
Title
Company
Address ZIP
Telephone

More than 70 exhibitors and 35,000 computer users are expected at the U.S. Computer Caravan/74

The regional computer users' forum

will you be there?

The Computer Caravan brings exhibitors and users together in a user-oriented, professional forum and exposition. The forums, workshops, panel discussions and seminars focus on an exchange of timely, practical information among users and independent experts. And the exposition gives users a chance to review a wide variety of the latest equipment and services, with their current needs in mind. This unique combination of forum and exposition gives computer users the first practical method of learning about and selecting equipment from a variety of manufacturers. And the results in sales are very impressive.

and exposition: it's the new EDP marketplace.

If you're a computer user, you'll find the Computer Caravan to be a unique new method of gathering the information you need to gain greater efficiency for your installation. And you'll also find that we're convenient. Unlike other computer shows, which make you travel to them, the Caravan comes to you–with a 3-day show in each of 10 cities across the U. S. in the Spring of 1974. Watch *Computerworld* for the details.

If you're a marketer, now is the time to act. The Caravan can accomodate 100 booths, and more than half of those have already been spoken for. We have all the facts you need to examine the new EDP marketplace closely, and we'd be glad to go over them with you. Just call Neal Wilder or Dottie Travis at (617) 332-5606. Or write to us at *Computerworld*, 797 Washington Street, Newton, Mass. 02160.

The Computer Caravan/74

sponsored by

COMPUTERWORLD

Washington • Cincinnati • Houston • Anaheim • San Francisco • St Louis • Chicago • Boston • Charlotte • New York

JCLs Adjusted for Partition

LYONS, Ill. – Even if device addresses differ, DOS/360 jobs can be run in any partition with a single set of JCL statements, by using the Device Assignment Controller package from General Electronics.

Not even a change in ASSGN cards is required using this support, the company said. The Controller examines every ASSGN and CLOSE statement and modifies them at run-time to device addresses that are valid for the partition in which the job is running.

Normally, a Controller user will set up all his JCL with addresses appropriate to a particular partition, probably Background. A disk file provides for each partition the device addresses equivalent to the "normal" ones.

The address file requires one track of disk space on the SYSRES pack, but the two programs that make up the Controller package use minimal main storage.

The Controller package is part of the Job Control Editor system, introduced earlier this year by General Electronics [CW, Mar. 14], but can be acquired and used separately.

Neither the Controller nor the Editor requires changes in the IBM-supplied DOS software. The programs are distributed in object form for a 10-day trial period. Source code is supplied on acceptance.

The Controller sells for a one-time charge of $300; the Editor for $200. Both programs can be acquired for $450. The firm can be reached through P.O. Box 79, 60534.

GA SPC 16/45 Runs Circles Around 360 Handling Fortran-Based Ledger Program

CHICAGO – A recent benchmark provides fairly convincing evidence that, given the right job and good support, a mini can do a business-oriented application both cheaper and faster than a system at the small end of the 360 line.

A set of programs, written in Fortran and producing general ledger reports, used less than the full 16K words (32K bytes) on a General Automation SPC 16/45, but, compiled on a 360/30, required nearly 65K bytes.

The programs were written by Applied Digital Technology Inc. (Adtech). I/O handlers to manage the peripherals on the mini, including a Calcomp 2314-type disk drive, and arithmetic routines that effectively mimicked the packing-operation-unpacking of 360 decimal arithmetic were part of the package.

Source Code Changed

On the 360 compilation, the source code was changed in two places, to make the byte-oriented machine take two bytes of data at a time, just as the GA mini did through its normal hardware architecture.

The application programs that were effectively benchmarked were a data edit routine, a concatenation or linkage run to create the tree-structured file used by the system, and a report generation run. Operating system interjections on the 360 prevented a clocking of good comparative times of the basic file structuring programs.

Identical data was used on the 360 and the mini and no floating point operations were included. The GA configuration included a Documentation card reader rated at 600 card/min and a Data Printer Corp. printer rated at 600 line/min, while the 360 had an IBM 2540 card reader (1,100 card/min) and an IBM 1403 N3 printer (1,100 line/min).

In the test runs, the editing program executed in 3 minutes 55 seconds at the GA-based installation. But it took 10 minutes 17 seconds on the 360. The concatenation runs were considerably closer, taking one minute even on the mini, and one minute 33 seconds on the IBM machine.

The GA-based program for account analysis (reporting) was clocked at 2 minutes 55 seconds; on the 360, it ran a flat five minutes. The same records were purchased in both cases but the slower-rated Data Printer unit actually appeared to be moving faster than the 1403.

Since source code and data were identical on the two machines, and the peripherals on the 360 were potentially faster, the Adtech people see the test results as a fairly clear indictment of the inefficiency of the code compiled by IBM's Fortran processor. And, they continue, the increased use of core on the 360 seems to confirm the thought.

The application logic is well suited to an installation without heavy DP experience. Accounts can be accumulated and the accumulations changed through parameter-card entries at run-time. Report formats can likewise be changed to fit new needs.

Any account numbers are acceptable and accounts can be combined with, or deducted from, one another at will.

Adtech is making the application package available for either 360 or the GA mini. It can also install the GA hardware, in the configuration appropriate to the installation, if that approach would help the user. The configuration used in the benchmark leases for $2,200/mo, the company noted. Maintenance of the general ledger software is available for $500/mo.

Adtech is at 8550 W. Bryn Mawr Ave., 60631.

Gourmet.

Computers are the fussiest eaters in the world.

Unless their diet is perfect, "indigestion" develops . . . and you are in trouble!

The computer's program is, of course, of critical importance. But an equally important dish is the continuity, purity and quality of the AC power the computer dines on.

Typical line power abounds with spikes and dips, minor transients, surges and other fluctuations that come and go as load and transmission conditions vary. For many applications these aberrations mean nothing. Commercial line power is fine to feed a light bulb, a motor, an adding machine. But not a computer.

Fluctuations like those above can easily distort or destroy your computer's memory, in whole or in part. They can even do physical damage to its components. Pure, precise power is needed, power without the slightest interruption or variation in voltage and frequency . . . power that continues in spite of momentary or long-term blackouts . . . power that can guarantee an orderly shut-down of the computer, if desired, with no damage or loss of bits.

The only way to get power like that is to make it yourself . . . with one of Lorain's Uninterruptible Power Systems. It's the choice of the fussiest gourmets around the country . . . real-time computers that are operating charge card billing, international airline and hotel/motel reservations, process controls, stock exchange operations, critical instrumentation and hospital facilities.

With the Lorain U.P.S., only pure AC power feeds your computer . . . raw utility line power never reaches your computer.

Let's talk about putting your computer on a Lorain U.P.S. "diet". We have systems to match the heartiest appetites from 125 VA to over 600 KW. Phone or write for details.

LORAIN U.P.S.

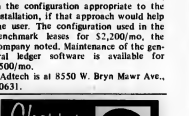
INTERNATIONAL SHOW Visit Booth 801

FIRST... by Design

LORAIN PRODUCTS CORPORATION
LORAIN, OHIO 44052 TWX 810 426 2130 · PHONE (216) 288 1122
LORAIN PRODUCTS (CANADA), LTD. / PRODUCTOS LORAIN DE MEXICO

LORAIN "IN DEPTH" ENGINEERING

Lorain Equipment includes: Rectifier-Chargers / Ringing Equipment / Inverters and other Power Supplies for Communications and Industry



Sherry Says...

The Data Communication Forum

Now that I'm supposed to be an "expert" in data communication, people come up to me at the ICC booth in the trade show and ask me all kinds of complicated questions. It's really great for my ego! Especially, since the question I'm asked most often is, "What are you doing for dinner tonight?"

If you communication types aren't sleeping too well, I can understand why. I just learned some of the problems you can have with transmission lines and, frankly, now they're even keeping *me* up. I may joke about *phase hits, jitter*, but until now, I didn't realize that it was just one type of something called *fortuitous distortion*. I don't know why they call it *fortuitous!* It can give your data communication a fit with gremlins like *impulse noise, harmonic distortion, quantizing noise*, and *phase hits*. Luckily, the ICC engineers who told me about this also assured me that they take these transmission line problems into consideration when they design their modems. So . . . to all of you ICC customers — *pleasant dreams.*

If you have questions or topics you would like to see in our column, send them to: "Sherry Says" c/o: International Communications Corporation 7620 N.W. 36th Avenue Miami Florida 33147

© 1973 a Stigo company

Data Briefs

Ralph Nader to Address Nata Annual Fall Meeting

MIAMI BEACH – Ralph Nader will be a featured speaker at the fall meeting of the North American Telephone Association (Nata) at the Deauville Hotel here Oct. 19 and 20.

Consumer advocate Nader will speak on the general subject of the telephone interconnect industry and its relations with AT&T, the FCC and public utility commissions.

Neil Swift of the New York State Public Utility Commission will also speak. Other reports will cover the Senate Subcommittee on Antitrust and Monopoly as it relates to communications, and the North Carolina and Nebraska situations.

Registration is $25 per person from the association at 1725 DeSales St., Suite 506, Washington, D.C. 20036.

Coupler Is Bell-103A/E Compatible

SUNNYVALE, Calif. – Anderson Jacobson, Inc. has brought out a combination modem/acoustic coupler designed to either originate calls from a terminal to a computer or to answer a call from another terminal.

The Model AD 342 is compatible with Bell 103A/E or equivalent modems.

The unit's sensitivity is -50 dBm when used with a DAA. Frequency accuracy is ± 0.1%, the firm stated.

The AD 342 costs $395, with deliveries beginning in November from the firm at 1065 Morse Ave., 94086.

Equalizer Corrects Line Distortion

SAN FRANCISCO – Karkar Electronics has introduced a variable delay equalizer to simplify conditioning of voice frequency circuits for data applications.

The Model 6031 Equalizer is designed to equalize a voice frequency line at levels of -35 dBm to +10 dBm with a maximum envelope delay distortion of 3 msec in the 300 Hz to 3,400 Hz range.

The Model 6031 costs $950, with delivery from 245 11th St., 94103.

Console Combines Film and Mini

CAMBRIDGE, Mass. – CSM Medical Devices, Inc. has brought out a mobile patient interview console for hospital or clinic use.

Multiple choice questions appear on the console's film strip projection screen. Patients respond by pressing one of six alternative response buttons.

A PDP-8M-based controller with 4K and a Diablo disk handles up to 16 centrally or remotely located consoles. Standard teletypewriters print reports. The patient interview console leases for $320/mo from the firm at 377 Putnam Ave., 02139.

TCA Conference Told

Bell: Local Loops Need State Approval

By Ronald A. Frank
Of the CW Staff

SAN DIEGO – AT&T has extended its hard line approach to the specialized common carriers by announcing that all requests for local loops will have to be brought before the proper state regulatory bodies.

Speaking to communications users here at the annual conference of the Telecommunications Association (TCA), Fox Stoddard, marketing director at AT&T, said requests to connect users with the specialized carriers would not be honored by Bell without state approval.

The specialized carriers rely on local loops provided by Bell companies to connect their facilities to customer sites. And despite a recent order from the FCC requiring Bell to provide the required local lines, AT&T apparently will now leave it up to the states to comply.

In a speech attacking the competition offered by the new carriers, Stoddard said 80% of the point-to-point private line users between Chicago and St. Louis are now using Microwave Communications, Inc. lines.

If the customer switch to the specialized carriers continues, Bell will lose $220 million/yr to the specialized carriers by 1976, he told TCA members. And this type of competition will cause "serious retrogression in AT&T's development plans to offer new services such as millimeter wavegude and optical transmission," Stoddard predicted.

Answering the AT&T position during a panel session on "The New World of Private Line Services," Laurence Harris, vice-president at MCI, said users for the first time have a choice of services.

The established carriers have previously shown "a complete unwillingness to respond to new demands" because the Bell System "only responds to actual competition," he said.

Harris told the users that because of the new carriers "you and your companies are able to buy a broader range of hardware tailored to your specific needs at prices which make communications economically feasible.

"If Bell does not comply with the FCC order to provide local loop facilities, then the final decision on interconnection will rest with the courts," Harris said.

Admitting that Bell's latest proposal to reexamine the effects of competition may not be accepted, Stoddard said the telephone companies are prepared to offer a range of new services in response to the specialized carriers.

Stoddard said one of the new Bell offerings will be a graduated rate service called Hipak, which will replace the current Telpak bulk rate discounts now available to large private-line users.

In response to a question from TCA member Pete Osborne, Stoddard said interconnection of specialized carrier services at Bell central offices will not "be done at this time and not in the future."

Stoddard's claim that the new carriers have not offered customized services to users as required by the FCC was challenged by Douglas Johnson, vice-president of Western Tele-Communications.

"The limitations of local loops made available by Bell makes it impossible for the new carriers to offer innovative services," Johnson said.

Bell companies will begin to "restructure rates" on the state level and one of the first examples is a possible California equivalent of AT&T's Dataphone Digital Service, Ray Hiett of Pacific Telephone & Telegraph told the attendees. The intrastate all-digital service would be available in as many as 100 California cities.

CW Photos by Ronald A. Frank

Stoddard Harris

deButts Hits 'Competition'

SEATTLE – Competition between the phone companies and non-carrier suppliers of equipment and private-line facilities is leading to "slow sabotage" of the common carriers, according to John D. deButts, AT&T chairman of the board.

Current regulatory trends will lead to "higher prices for poorer service for most customers," the AT&T chief said. The notion that competition is good and monopoly is bad could destroy the common carrier principle, he added.

Speaking at the annual meeting of the National Association of Regulatory Utility Commissioners (Narue), deButts called for a "moratorium" on further experiments in economics. The reference apparently was meant to apply to the competition offered by the new specialized common carriers and the interconnection of customer-provided communications equipment by non-carrier suppliers.

AT&T's experience so far with "competition in ... customer-provided telephone equipment and special private-line services suggests an urgent need for caution before proceeding to a further liberalization of interconnection requirements," deButts said.

"No system of [equipment] certification we can envision and no interface requirements can provide a fully adequate alternative" to the ... responsibility of the common carrier, he said.

Current AT&T studies of customer-provided equipment being used on private lines show a trouble reporting rate "that is at least 50% higher" than the rate of troubles reported by customers who have carrier-provided equipment.

Referring to MCI's private-line service between Chicago and St. Louis, deButts said:

"MCI has captured over 80% of Bell System point-to-point private-line services between customer premises in those two cities. What is more, 40% of MCI's customers are businesses that formerly relied exclusively on the Bell System's long-distance services between the two cities, but who now use MCI private lines for a substantial portion of their requirements.

"This experience foreshadows what can happen as our presumed competitors extend their activities selectively to other routes and, eventually, to most if not all of the more profitable major communications corridors in the nation.

"In less than three years, these carriers – at their currently projected level of development – will have siphoned off no less than $220 million of revenues that private-line services would otherwise contribute to meeting the common costs of the Bell System's other services.

"Again, where will the burden fall? Again it will fall on the average customer in the form of higher exchange rates, higher long-distance charges. It will fall, too, on private-line customers in cities and towns on the high-cost routes the specialized common carriers choose not to serve," he said.

"For what only some people want, everybody will pay. For the sake of contrived competition that will afford some people advantages, most people will be hurt in the long run," the AT&T chief said.

Competition will seriously impair service over the long run and add significantly to the cost of telephone services, deButts warned.

Hundreds of Vadic Modems are Installed at OTB's Central Computer Facility

vadic
505 East Middlefield Road,
Mountain View, Calif. 94040
(415) 965-1620
TWX 910-379-6567

Dear Ma:
I spent last weekend in the Big City and won $28.40 in off track bets - with the help of your telephone network and Vadic modems.
New York City's Off-Track-Betting Corporation chose Vadic because their modems cost less, perform great and have powerful built-in displays and diagnostics.
With over 1000 Vadic 202 & 103 type modems scattered over the city in betting parlors and in the central computer facility, the annual savings to OTB is substantial partly because Vadic 1200 baud modems work beautifully on reconditioned lines.
Vadic's powerful built-in diagnostics such as remote loopback tests are particularly useful since OTB servicemen can quickly isolate a problem to the terminal, the network, the computer interface or the modem.
This ability to rapidly troubleshoot a faulty channel is very important since Off-Track-Betting has a daily sales volume greater than Macys or Gimbels - and just can't afford lengthy down-time.
P.S. Who's Vadic? They've delivered over 20,000 modems to date.

Your independent thinking son,
Alexander Graham Jr.

MOUNTAIN VIEW CALIF
-PM
2 JAN
1973

Ma Bell
195 Broadway
New York, NY 10007

When you need 3M's help, we'll call out the whole clan.

When you use "Scotch" computer tapes and disk packs, you get the combined skill and dedication of more than 1000 special people. The 3M Clan. People who have led the industry with innovations in computer media technology, starting with the development of the first computer tape in 1953. A clan which stands behind its products with one of the largest and most extensive groups of technical sales representatives in computer media. People who thrive on assisting. People who will go to any length to solve a customer's problem. The Data Recording Products Division of 3M. A proud clan.

"Scotch" is a registered trademark of 3M Company.

3M COMPANY

SYSTEMS&PERIPHERALS

Hardware Advance... ...Tied to Old Software

New 32-Bit Mini Directly Addresses 1M-Byte Memory

By Michael Weinstein
Of the CW Staff

OCEANPORT, N.J. – New computer releases are much like a form of speeded-up evolution: each new machine is a designed mutation offering more or cheaper capabilities built on the techniques and architecture of its predecessors.

Using this analogy, Interdata's 32-bit minicomputer is a significant new species because it attacks a basic restriction inherent in all previous 16-bit minicomputers – the ability to address directly only 64K bytes of real memory. The maximum memory now available from the firm is 1M byte.

The Model 7/32 is also significant in that it follows a long line of 16-bit machines and so retains some of the limitations of its forebears.

Thus, any discussion of the Interdata 7/32 is best divided into the machine, the breakthrough and the limitations.

The Machine

In its basic configuration, the 7/32 is a three-board central processor packaged in a 16-slot chassis. The CPU has two sets of 32-bit registers – 16 registers in each set. One set is for user programs; the other is for the operating software and I/O handling.

Typical of Interdata machines, the 7/32 is a microprogrammed processor driven by a read-only memory (ROM) control store. Average microinstruction execution time is 250 nsec for a user-level instruction set containing more than 200 commands.

Typical execution time for a 32-bit register-to-register add operation is 1 μsec.

With three slots in the 16-slot chassis used for the CPU the remaining slots can be used for any user-specified combination of memory and/or I/O control boards.

Memory boards are available in 8K-, 16K- and 32K-byte sizes, but due to the potential size of real memory – presently offered to 1M byte – most users are expected to add memory in the larger 32K-byte increments. Cycle time for these memory boards is 750 nsec and cost is $4,500 per module.

A second option is to expand using slower 32K-byte modules of 1-μsec memory costing $3,950 each.

I/O is handled by a separate reserved "stack" of 16, 32-bit registers. An automatic driver channel provides automatic character I/O and automatic conversion. The I/O subsystem communicates with up to 1,048 peripheral device controllers, with automatic hardware interrupt vectoring. Interrupt response time – from the separate I/O registers – is 4 μsec, with normal latency also at 4 μsec.

Peripherals and supporting software include a 10M-byte disk subsystem, a 1,600 bit/in. magnetic tape transport, two video display terminals and a 600 line/min line printer.

Software for the 7/32 includes a serial task operating system (OS/32-ST), Common Assembler Language (CAL), text editor (EDT), Fortran IV and other loaders, diagnostics and test programs.

New Product Analysis

Interdata also expects to offer a multitask operating system sometime before the end of this year as well as a symbolic debugging facility later, a spokesman said.

The Breakthrough

The major gains realized in the 7/32 are the ability to directly address up to 16M real memory locations coupled with the price for that capability.

A common problem with 16-bit minicomputers is their ability to address directly only 64K memory locations – 2^{16} = 64K.

That this is a real problem can best be realized by noting that a large array in Fortran can easily take up more than 64K bytes of real memory just to store.

To go beyond that point these 16-bit minis use memory segmentation and relocation units which adds to the cost and affects speeds and performance.

A second method – used by IBM – is to utilize a base register area behind a register area showing sector location. For example, the first eight bits might indicate what 64K-byte sector of memory is to be referenced and the final 16 bits would indicate the exact location within that sector.

The 7/32 is "one up" on either of these methods by having a 24-bit absolute address. This means that any one register to indicate memory command can directly and uniquely address up to 16 million locations.

This becomes a significant feat when coupled with a single unit price of $9,950 for the central processor and 32K bytes of memory.

The Limitations

Despite these advantages the 7/32 is still held to its "forebearing" 16-bit machines by the umbilical cord of software. To provide an upward growth path for the 16-bit mini users the new machine is designed to handle their software.

Architecturally, this means the memory bus is only 16-bits wide and the memory is built in blocks also 16-bits wide.

This also means it takes two 750-nsec passes to load one 32-bit register from memory. As long as manipulations remain within the CPU this time constraint is inoperative as internal speed is only determined by register-to-register moves.

From the hardware side it would not be difficult to expand the memory bus, possibly coupled with the release of faster semiconductor memory.

In any case it is safe to state if the 7/32 remains in its present state for a long time it could be construed as an inability or lack of desire of Interdata to write the required operating software.

Prices

With 64K bytes of higher-speed core memory, the 7/32 costs $14,450; with 128K bytes the price is $23,450; 256K bytes of memory raises the price to $41,450; and 512K bytes of memory boosts the cost to $78,950. The maximum memory available from the firm, 1M byte, with CPU will cost around $171,000, a spokesman said.

The firm is at 2 Crescent Place, 07757.

20,000 Jobs/Mo

Japanese System Handles 1,450 Users

Special From Shukan Computer

TOKYO – Tokyo University's computer center uses a self-service open batch processing system to handle the work of 1,450 registered users and 20,000 jobs each month.

The center had operated Hitac 5020E computers, but recently added two units of the large-sized Hitac 8800 and two Hitac 8700 units.

These last four CPUs are interlocked to form a multiprocessor system sharing four input/output process (IOP) systems and a 3M-byte main memory.

A buffer memory is between the main memory and each CPU. To achieve high-speed processing, the pipeline process method is applied to the Hitac 8800s.

The system uses virtual memory and four units of a mass disk system (233M byte) are used as personal files to house the users' programs and data.

The computer center's operating system manages the virtual memory, multiprocessing and multiprogramming. The OS includes various language processors and file systems, a time-sharing system, a closed and open batch system, a remote batch system and real-time processing of the graph system.

The center's service method is its open batch processing method which uses self-service to reduce turnaround time.

Users can input their programs or data directly from the card reader. The results of job processing are stored on magnetic disk. These results can be output to the line printer with the automatic cutter, of which there are eight units for the open batch system, by a token card carrying the user's identifying number.

User Casebook

The character display indicates the list of the job which has been read from the card deck with its input time. When the job has been performed, the theme number and other data are shown on the same display.

Time of Input

The "talking sign" in the center's lobby, indicates, according to the job shes, the time when jobs presently being processed were input to the system.

This permit users to process their own job without having to depend on the center's operator.

As part of an "energy-saving" policy, the center also practices automatic packing of output papers, automatic classification of output, use of the capital letter pages, self-service utilization of magnetic tape, multiplication of the operator console and active use of management information.

The center achieved the first three items by its coding routine system which was organized into the operating system (OS-7) of Hitac 8800/8700 computers.

The self-service use of magnetic tape and multiplication of the operator console were achieved by the application of the function of OS-7 and the wireless microphone and the monitor television to this system.

Action System

The active use of management information comes from the program that arranges account file contents and the user registration note (Join File).

The center is open to the research workers of colleges, universities and professional high schools. Its program library lists more than 300 programs, most of them produced in Fortran for scientific research purposes.

New System 370's Attractive Delivery Schedules.

For Sale or Lease. Terms: From 3 Years.
ITC Available. Contact Ed Tibbits or Dean Herrer.
at (315) 474-5776

CIS
CONTINENTAL INFORMATION SYSTEMS CORPORATION

SYRACUSE, N.Y. Midtown Plaza 13210 (315) 474-5776

Delivery Schedules

370/145 Model 12
Immediate Delivery
370/158 Model J
#1 Delivery 10/5/73
#2 Delivery 11/16/73
#3 Delivery 1/18/74
#4 Delivery 2/15/74
370/158 Model K
Delivery 10/19/73
370/168 Model K
#1 Delivery 4/19/74
#2 Delivery 5/17/74
#3 Delivery 5/17/74

Recurring Computer Nightmare #4

The day the uniforms arrived at Fort Custer.

Blame it on the programmer, or maybe an ailing diode. But the last thing you need is an error that makes basic even more of a drag for 5,000 recruits.

What you do need is a way to cut your possibility of error down to an absolute minimum. And the easiest time to start is when you place your next order for computer tape. Just specify BASF.

At BASF, we produce computer tape that's probably a lot better than you'll ever need . . . just in case. For example, our special finishing operation produces a hard, smooth tape surface that's a lot kinder to your tape head, and keeps your maintenance time to a minimum.

One more point. Our tapes don't cost any more than the competition's. You're already paying for BASF quality . . . you might as well have it. Write today for the complete story of how BASF tapes stack up against the competition. Remember, nobody makes better tape than the people who invented it. BASF Systems, Crosby Drive, Bedford, Mass. 01730.

When it's BASF...you know it's

not the tape that goofed.

TRADING YOUR 360 FOR A WHAT?

Then you've been spending some restless nights worrying about

- **Virtual memory – what does it really buy?**
- **Total monthly rental – isn't it higher than you expected?**
- **Newly promised software – will your small staff ever get it running smoothly?**
- **DOS on 360's – is it really frozen?**

We've asked those same questions and come up with some pretty interesting answers. They're in our summer newsletter – yours for the asking.

NATIONAL COMPUTER RENTAL, LTD.

415 Madison Avenue, New York, N.Y. 10017
(212) 832-1900

Member of Computer Lessors Association

Accounting Users Get Turnkey System

SAN LEANDRO, Calif. – The new 6800 general accounting system provides a total hardware and software turnkey system for users with accounting applications, according to a spokesman for Singer Business Machines.

The basic hardware includes a desk-size central processor (3.3 µsec cycle time) with up to 30K characters (6-bit character) of core memory. On-line storage is in the form of a disk subsystem, with resident and removable moving-head disks providing a total storage capacity of 8M characters. Average access time for the disk system is 37.5 msec with transfer rate of 290 byte/sec.

I/O is handled through a video display or standard terminal and a 70 line/min impact drum printer.

Application packages include sales accounting – which includes invoicing and order entry; accounts receivable; inventory and sales analysis; general accounting – including accounts payable; general ledger; and payroll.

The 6800 system is modular and compatible with Singer's larger System Ten computer. This modularity allows the user to start with a basic system including only those software packages and hardware components he initially needs and later add more applications, the spokesman said.

The system is offered in two configurations, the 6810 and the 6830.

The 6810 is a printing workstation terminal system including the central processor with 20K characters of core memory, disk subsystem and Model 70 workstation and sells for around $30,000.

The 6830 is a display-based system which includes the CPU with 20K characters of memory, disk subsystem, line printer and video display terminal. It costs around $40,000.

One memory upgrade of 10K characters is available for about $6,000.

Application software is priced separately at $1,200 per package with the exception of the inventory and sales analysis package which costs $3,900.

Delivery is from the firm at 2350 Washington Ave., 94577.

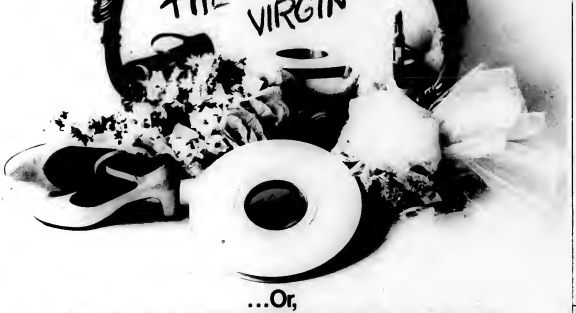
Brownouts to Shedding

LOS ANGELES – General electrical power brownouts may become a thing of the past. They will be replaced by an equally sinister practice called "selective load shedding," according to Dr. John Salzer, a principal at Darling & Absobrook, a Los Angeles consulting firm.

In the familiar brownout situation, Salzer explained, the power company lowers the voltage supplied to all customers, "usually between 1% and 8%."

The newer load shedding is where the power company "intentionally blacks out a small portion of its service area while continuing to provide full service to the rest of its users."

How should users react to this new tactic? Salzer suggested they try to convince the power company their "process rates priority service; or . . . select a plant site in an area designated for priority service, or they can install an uninterruptible power supply."



...Or,

"error-free" doesn't necessarily mean nobody's fooled around with your tape.

In the computer tape business, they sometimes keep important little secrets from you. For example, tape that's supposed to be virgin (certified as "error-free" at time of certification) doesn't necessarily mean its never been touched. This is shown at left. Tape in top picture has been scraped or "doctored" so serious imperfection passes undetected by the certifier. But repaired error (bottom picture) is now detectable after 100 passes on tape drive.

Wabash, we are proud to say, offers you Quedronix I – **the industry's first certified write-skip free computer tape.**

Wabash has developed a manufacturing process so sophisticated that we can electronically map, diagnose, and correct imperfections in the manufacturing process itself – **before certification.**

Quadronix I is virgin tape, unrepaired because it needs no repairs. If you've heard differently, hear this. **Quadronix I is certified for life.**

We can't answer for the "little white lies" other tapes may tell you, but we can promise you one thing. The integrity of our tape is above reproach.

Let's hear the whole story of the wayward virgin
And Quadronix I-the industry's first truly virgin computer tape.

Name

Title Phone number

Company

Address

City State Zip

wabash

Wabash Tape Corporation, Huntley, Illinois 60142. A subsidiary of Wabash Magnetics, Inc. (312) 669-5181 Teletype 910-651-1900

PAY-RYTE

COMPLETE PAYROLL SYSTEM

- HIGHLY OTHER FEATURES
- 32K 100% COBOL
- Multi Co. Div. Dept
- All Pay Frequencies One Pass
- Salaried/Hourly Payrolls
- Union/Non Union Rate Matrix
- Up to 99 Types of Pay
- Up to 99 Misc. Deductions
- All Fed./State/Local Taxes
- All Canadian Taxes
- 20 Reports Listings
- Checks or Blank Statement
- Free Specification Manual
- Complete Documentation
- Money Back Guarantee
- [illegible]

$6,500

CONDATA, INC.

[illegible]

COMPUTER INDUSTRY

CI Notes

Teale Center Bids Opened

CW West Coast Bureau

SACRAMENTO, Calif. – In an effort to negotiate a contract for EDP equipment for the Stephen P. Teale Computer Center by Dec. 15, the state Business and Transportation Agency has announced it has requested all interested parties to signify their intent to submit proposals by Oct. 15.

Proposals must be submitted by Oct. 31.

The state was recently given permission by the legislature to negotiate for the equipment for the multimillion dollar center designed to consolidate computer needs of 34 state departments.

Two efforts to get a low bidder produced only one bid – by IBM. Last week IBM ran a benchmark test.

Potential bidders can bid on one or all of six sections of work – project management, conversion, training, hardware, software and proprietary packages.

Suit Filed Against Tymshare

CW West Coast Bureau

LOS ANGELES – Allen-Babcock Computing, Inc. has filed a suit for about $45 million in Los Angeles Superior Court against Tymshare, Inc., Cupertino, for breaking off a proposed merger.

The complaint accuses Tymshare, its officers and attorneys with conspiring to enter into the merger plan as a means of acquiring Allen-Babcock's business, trade secrets, customers and key technical personnel and forcing Allen-Babcock into bankruptcy or other debtor relief.

A Tymshare official said last week the suit is without merit and will be vigorously opposed.

New Products at Qantel?

HAYWARD, Calif. – Qantel Corp. is expected to announce two small business systems around the end of the year.

The models 1100 and 1200 will cost between $30,000 and $35,000, sources said.

Supershorts

Computer Hardware Consultants and Services, Inc.'s accelerator for the IBM 360/30 has been placed on the General Services Administration's schedule.

– – –

Tesdata Systems Corp. has named Mitsubishi Corp. and the Mitsubishi Machine Co., Ltd. as sole agents for its products in Japan.

– – –

Analog Devices has established a Systems Development Division to continue the integration of existing product lines into application-oriented systems.

– – –

Diablo Systems, Inc. is shipping its Series 40 disk drives to Wang Laboratories for use in its minicomputers.

IBM Notes Reveal

Six FS Design Concepts Stressed

By E. Drake Lundell Jr.
CW Washington Bureau

WASHINGTON, D.C. – IBM has been giving major emphasis to six architectural concepts for its Future System computer line expected in 1975 or 1976, according to recently uncovered IBM Management Committee notes.

The six include Storage Systems Hierarchy, Parallel Systems, Vector Processing Systems, High Level Language Organization, Large-Scale Multiprocessing and the "Service-Free System."

While it is not known what the IBM planners finally decided – either one of the concepts or a combination – the following is how the concepts were described by IBM in the middle of 1971:

- **Storage Systems Hierarchy** – "We know that when a computer has used any given item in its memory, it is more likely than not to use the same item again in the near future. This and other statistical observations make it possible to manage a small, fast buffer memory so that it almost always contains what is wanted. On those occasions when it does not, reference is automatically made to a larger (but slower) backup memory."

The planners pointed out this concept was used on the 360/85 and on "many" 370s, but added: "Its surprising effectiveness leads to the question whether extended hierarchies using successively larger but slower storage devices (for example, drums, then disks, then tapes) may not be equally effective if designed into a total storage system on a similar statistical basis."

- **Parallel Systems** – Noting that parallel systems like the Illiac IV are in use, the planners, who called such parallel systems "not unlike the gang lawn mowers used to cut golf course fairways," said those systems included many arithmetic units operating under one control.

They noted this was effective on large scientific problems, but said "other problems are divisible but not into similar pieces" which lead to the development of multiprocessor systems that are made up of several arithmetic plus control units or essentially separate CPUs linked together.

However, IBM researchers have developed a system, the group said, where "one can keep the separate controls, or instruction units (I-units), but replace the separate arithmetic, or execution units (E-units), with one unit powerful enough to be shared by the several I-units."

There are two advantages to this approach, according to the IBM planners:

- "We are able to build E-units which are much faster than corresponding I-units."
- "Only 25% of the instructions in a program involve arithmetic or otherwise require the E-unit; the majority are easily and properly done in the I-unit."
- **Vector Processing Systems** – These systems have much in common with the parallel units, the planners said, and are used primarily in large-scale scientific work. As an alternative to parallelism a designer can develop a system that will be specifically designed to handle these vectors or arrays.

"Such systems have much in common with parallel systems but the knowledge that one is dealing with vectors does help the designer in several ways to make a fast and efficient layout."

Most observers feel IBM is least likely to adopt the Vector processing systems technique to any computer line, but might use it in special models for the scientific and oil exploration communities, where the ability to handle arrays is important.

- **Higher-Level Language Organization** – "The 360/370 architecture deals with rather simple instructions such as load, store, branch, add, multiply, etc.," the planners noted, adding, however, that higher-level languages automatically handle a lot of details for the programmer.

"Since each language statement (or instruction) does the work of several of the simpler, machine-level instructions, these languages are referred to as 'higher level' (higher, that is, than 360/370 or previous machine level)."

However, the planners said, presently "one can design hardware which will do these higher-level instructions more directly and similarly one can define architecture at this higher level rather than the current 360/370 level."

- **Large-Scale Multiprocessing** – "One motivation for multiprocessing is simply to do work in parallel," the planners said.

But, they added, "another motivation, which distinguishes it from more specialized parallel processing, is the possibility of assured availability. In this case the loss of one CPU will not bring the system down since there is at least one remaining to carry on."

- **Service-Free System** – This concept was developed in a special IBM in-house study aimed at "significantly" reducing "the amount of maintenance required by the CPU and channels of a medium performance system.

"Two approaches were used. In the CPU a relatively small number of very high-speed circuits was used to attain the same performance level as is customarily designed with larger numbers of medium-speed circuits. Since the reliability per circuit is actually expected to be better for the high-speed than for the medium-speed technology and since there are fewer circuits to fail in the high-speed version, the CPU reliability should be significantly higher and service requirements correspondingly lower.

"In the channel and I/O interconnection area a novel single 'wire' or loop system operating at very high speed was proposed to replace the numerous cables which now prevail.

"The point here is that much trouble comes from the cabling and connectors of present systems. This loop system also permits moving intelligence inboard from the channels to the CPUs."

Double Trust Division Resources, CIA's McGurk Tells House Unit

By a CW Staff Writer

WASHINGTON, D.C. – The resources of the Antitrust Division of the Department of Justice should be doubled and the division should acquire more management skills to handle major cases like the IBM case, Dan McGurk, president of the Computer Industry Association, recently told a House committee.

While the nation should be concerned about the efficiency of the judicial process, McGurk told Subcommittee Number Five of the House Judiciary Committee: "Let us also take the time and money to do a thorough and effective job in major cases where the economic stakes for the nation run into the billions of dollars."

Noting that the Antitrust Division currently works on a budget of between $11 million and $12 million a year, McGurk asserted: "We would rather see the government spend $25 million a year in tax dollars and bring even the most important cases to a fair and just conclusion in, say, five years, than to see the government spend $12 million and let the case drag on inconclusively for decades."

But the additional funding should be given to the department over a period of time, he suggested, and should follow a well-thought-out plan.

In addition, he said, "This plan should make specific provision of accelerated handling of major actions. And I venture to suggest that when the division has a major, complex action on its hands, it should formulate very clearly and specifically a program for handling that case on a planned, thoroughly worked out basis.

"I can tell you this: the dominant company in the computer industry didn't get where it is today without having this kind of management capability," McGurk stated.

They're all talking about Capitol Datasettes...
(except the dog...he's just listening).

Ten minutes ago the guy on the far left told everyone that Capitol Datasettes are 100% certified after assembly. That started the conversation. The gal in the center piped-up and said that they comply with all ANSI and ECMA standards. Well, everyone had his turn to speak. Except the dog, of course. To find out what they all said, please send for our brochure. It's a conversation piece.

Capitol Datasettes
DIGITAL CASSETTES

Audio Devices, Inc., Glenbrook, Conn 06906 A Capitol Industries Co

Epoch 4 was far ahead of its time when Graham Magnetics developed it.

So if you're getting ready to phase in the newest generation of high-speed, high-density drives, you can rest easy as far as computer tape goes.

Epoch 4 users are
because its high the
face friction and
enable it to perform
high speed drives as
6250 BPI? Epoch

an enviable position,
properties, low sur-
gh packing density
s well at 6250 BPI on
as at 1600 BPI.
ready when you are.

GRAHAM
MAGNETICS
Graham, Texas 76046

Building for Mini Makers

Decision Delayed OCR for Larger Market

By Molly Upton
Of the CW Staff

OAKLAND, Calif. – On its way to the optical character recognition marketplace, Decision, Inc. discovered the OEM market for controllers for Data General Corp.'s Nova.

And now the company is thinking of expanding into peripherals for other mini makers, according to Rick Dove, director of marketing.

However, the firm believes the time is "right" for OCR, and

Joan Kelleher assembles Decision's 15-inch board that includes phase encoder and formatter.

first delivery of its OCR 7600 optical page reader, introduced at the National Computer Conference in June, is scheduled for October.

The company was formed to produce OCR equipment three-and-a-half years ago by four scientists from Lawrence Radiation Laboratory.

The original plan called for the unit to incorporate a minicomputer, and the Nova was chosen. However, Decision wanted a

Ross Wilson debugs 3180 controller and Wang tape drive.

moving head disk, which was not available from Data General then, so it built a controller and operating system for another disk.

"You might say we went in through the back door to the peripherals market," Dove said.

Decision decided to delay entering the OCR business as it needed money and the timing didn't look right, Dove said.

"No one has been too late entering the OCR market," he added.

The firm settled in three storefronts just across the line from Berkeley, formerly occupied by a carpet store and a Woolworth's, among others.

In its second year of existence, Decision brought out the 6500 Optical Mark Reader. "We sort of cut our teeth on the mark reader," Dove said.

The keys to the OEM market are software and support, according to Dove, adding that the firm has three DOS offerings: one that is very general purpose and two high-speed.

Decision's principal support is information, he said, noting that the firm's programmers are available to talk with those of the OEM customer. In this manner,

Rick Dove, director of marketing, illustrates matrices used in character recognition.

the OEM can improve support of its unit. "We've never lost a major OEM customer," Dove added.

Decision developed a controller that includes both a phase encoder and formatter, all on a 15-inch board that fits inside the Nova. "At first we had a hard time taking orders for it as no one believed the product ex-

(Continued on Page 27)

Here's how

with the Datapoint 2200 -a single integrated system for:

Data conversion/Entry

IBM 370's

are leased to save money.

CSA leases provide long term economy, while customers enjoy the flexibility of upgrading and early termination.

For further information, please call (617) 482-4671

Computer Systems of America, Inc.

a computer equipment leasing company
141 Milk St. Boston, Mass. 02109

Send for the 12 questions you should ask of any leasing company before you lease.

Name_____
Title_____
Company_____
Address_____
City_____
State_____ Zip_____
370 on order ☐ installed ☐
Model_____ Due Date_____

Funds Cut for REI Contract

DALLAS – Recognition Equipment, Inc. (REI) has been notified by the U.S. Postal Service that no further funding will be available under the Advanced Optical Character Reader (AOCR) research and development contract.

The company has expended all existing funds under the contract and, in the absence of further funding, is terminating all further work under the contract.

Costs of approximately $300,000 may not be recoverable under the terms of the contract, REI said.

Recognition Equipment has received almost $13 million since July 1970 to develop the AOCR, a high-speed letter-sorting system. The prototype was installed in the New York General Post Office in May 1973 but had not yet met all of the performance standards required by the postal service at the time of termination.

The company's other principal program for the postal service, known as CSOCR II, is continuing but will require additional funding in the near future, the firm said. Future funding under this contract is under negotiation.

Ruling Should Give Japan COM Boost

By Michael Weinstein
Of the CW Staff

TOKYO – After seven years of intense but futile marketing, computer output microfilm (COM) sales here may be ready to take off, according to the monthly newsletter *EDP Japan Report*.

The catalyst for the expected success is a ruling by the Japanese House of Representatives that microfilm can be used as legal evidence.

Japan's Commercial Code obliges corporations to preserve their account books for 10 years. Before the new ruling these records could not be contained on microfilm or magnetic tape since these media were not considered legal evidence.

Since, even if business data were kept in the form of microfilm with the aid of COM, the original account books also had to be preserved at the same time, there was little merit in adopting the COM system, the report stated.

Prior to the July ruling, "only 73 units of this system (COM) were in use in Japan," even though COM sales began here in 1965, the report noted.

In fact, COM sales were so slow it took three years before the first systems were installed "and five years after the start of sales activities that end users started to adopt the COM system."

But with the new ruling, COM is expected to make a strong showing in banking, insurance and accounting firms. The second ranking group of users is expected to be sales firms using COM for backup of sales records.

Decision Ponders More Controllers

(Continued from Page 26)

isted," Dove said.

But since deliveries began last August, this situation has changed. Placement of the one board inside the Nova eliminates the need for rack space, the extra board, an additional power supply and cuts down on noise, he added.

Decision currently is thinking about making controllers for minis from Digital Equipment Corp., Computer Automation, Inc., General Automation and Datapoint, Dove said.

In 1972, about 80% of the firm's business lay in controllers and 20% in its mark reader.

A year ago, the firm decided the time was right for an OCR product. This paralleled IBM's decision that 1973 was the year of OCR, he noted, and a prototype Decision OCR unit, with a floppy disk, was shown at the National Computer Conference.

The product, directed at the OEM market, is designed to look like a Xerox copier so it won't frighten people, Dove explained. The unit, which reads at 600 char./sec, is priced at $60,000 for a single unit, and $30,000 in quantity.

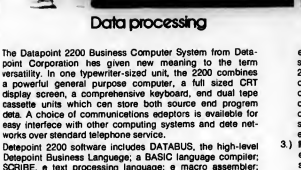
Dove said he thinks the market for OCR equipment will be larger than projected in various studies, which were probably made before the introduction of a low-cost page reader. And they generally ignored the possibility of low-cost units for turnkey applications, he added.

The firm is scheduled to make 15 OCR units by the end of March.

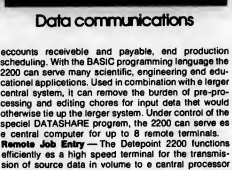
In 1974, plans call for the manufacture of around 200, he said.

This suggests considerable expansion of the firm and the possibility of divisionalizing exists, he noted.

Datapoint delivers



Data processing



Data communications

The Datapoint 2200 Business Computer System from Datapoint Corporation has given new meaning to the term versatility. In one typewriter-sized unit, the 2200 combines a powerful general purpose computer, a full sized CRT display screen, a comprehensive keyboard, and dual tape cassette units which can store both source and program data. A choice of communications adaptors is available for easy interface with other computing systems and data networks over standard telephone service.

Datapoint 2200 software includes DATABUS, the high-level Datapoint Business Language; a BASIC language compiler; SCRIBE, a text processing language; a macro assembler; RPG II; Disk and Tape Operating Systems; emulator software packages for most standard terminal units and many utility programs. The basic processing power of the 2200 can be augmented by a complete roster of optionally available peripheral units, which include serial and line printers, 7- and 9-channel tape units, a multiple drive disk attachment and numerous communications interface adaptors.

This comprehensive hardware/software capability makes it possible for the 2200 to work effectively in a variety of applications, including:

1.) **Data Conversion and Entry** — Possibly the most popular current application for the 2200. The CRT display screen permits easy visual scan of data entered via the keyboard. The internal computer's full programmability allows full and varying format display plus incorporation of various error checks, for fully verified data entry. This data can be stored in the unit's own tape cassette, for either on-line or off-line transmission to a central processor system.

2.) **Dispersed (On-Site) Data Processing** — Through a simple selection procedure, the Datapoint 2200 can be utilized as a formidable independent computer system with up to 16K memory. Through DATABUS, it's especially well suited for business applications such as inventory control, general ledger, payroll, accounts receivable and payable, and production scheduling. With the BASIC programming language the 2200 can serve many scientific, engineering and educational applications. Used in combination with a larger central system, it can remove the burden of pre-processing and editing chores for input data that would otherwise tie up the larger system. Under control of the special DATASHARE program, the 2200 can serve as a central computer for up to 8 remote terminals.

3.) **Remote Job Entry** — The Datapoint 2200 functions efficiently as a high speed terminal for the transmission of source data in volume to a central processor and the receipt at field offices of management reports and statements. Utilizing optionally available tape end/or printer attachments, data can be moved at up to 9600 baud.

4.) **Time Sharing** — The 2200 can be readily utilized as a time sharing terminal, linking directly via telephone service with a central time shared computer system for interactive problem solving. Its video screen allows easy problem statement display and editing.

All these capabilities are combined not in four separate units but in a single integrated system, the Datapoint 2200. Prices on the 2200 begin as low as $6,040. For information on how Datapoint can provide you with a single answer to your data conversion, data communications and data processing requirements, write or call the sales office nearest you or contact: Datapoint Corporation, 9725 Datapoint Drive, San Antonio, Texas 78284, (512) 696-4520.

Datapoint

Home Office: 9725 Datapoint Drive/San Antonio, Texas 78284 (512) 696-4520 • Sales Offices: Albuquerque, N.M. (505) 265-0190 • Atlanta (404) 458-6423 • Boston (617) 237-2090 • Chicago (312) 671-5310 • Cleveland (216) 283-0323 • Dallas (214) 630-1342 • Danbury, Conn. (203) 794-0800 • Denver (303) 771-0140 • Detroit (313) 347-8092 • Greensboro, N.C. (919) 299-8401 • Liberty, Mo. (816) 781-0400 • Los Angeles (213) 645-5400 • Melbourne, Fla. (305) 727-3205 • Minneapolis (612) 854-4054 • New York (212) 758-4866 • Orlando, Fla. (305) 671-4500 • Philadelphia (215) 542-5787 • Phoenix (602) 265-3909 • Portland (503) 244-0101 • Salt Lake City (801) 272-3681 • San Francisco (408) 732-9953 • Washington, D.C. (301) 937-2215

• International Representatives: TRW Communications/Toronto, Ontario, Canada (416) 481-7288 • TRW Communications/Lyss/Berne, Switzerland/Telex 845-34445 • TRW Electronics-International/Los Angeles, California/Telex 674993

FOR SALE OR LEASE
50% TO 80%
COMPUTER MARKETING INC.

360/65 MULTI PROCESSOR MEMORY SYSTEMS

BETTER THAN THE "GENUINE ARTICLE"

INTERMEM 7065MP MEMORY SYSTEM

for

THE IBM 360/65MP

HAS IBM MULTIPLE SUPPLIER MAINTENANCE APPROVAL

CALL OR WRITE:
INTERMEM CORPORATION
MARKET STREET
WAPPINGERS FALLS, N. Y. 12590
TEL. 914-297-5996

— THE SYSTEM ENHANCEMENT COMPANY —

For Software, Consulting

Multinational Systems Firms Emerging

By Ken Barnes
Special to Computerworld

European software companies and consultancies have not been subject to the same inhibitions that have prevented mainframe makers from creating a unified challenge to IBM in the mainframe market.

They have no vast capital investment program, commitment to existing hardware ranges or pressure from government to maintain a nationally based technology.

The result is that the creation of European-wide consulting groups in the computer field is possible and is already happening.

Major multinational groups in the systems and consulting firms will emerge within the next two years.

Only two countries in Europe, UK and France, have developed their own independent dedicated mainframe computer manufacturers and these have spawned the largest number and most active computer consultancies.

Only the UK companies, however, with perhaps one or two exceptions, have ventured outside national boundaries during the past five or eight years.

Recently activities of the computer consultancies have fallen into two major sectors: the design, selection and implementation of large real-time computer systems, and the provision of total systems often based on a minicomputer.

The major European computer consultancies are now large enough, sufficiently well-established, and have the financial strength to offer total systems to end users.

In the large systems field, the European market currently offers tremendous opportunities to the major consultancies. The planning and development of pan-European communications systems in the commercial, industrial and defense fields is already under way.

Whether national governments like it or not, U.S. hardware and possible know-how will be involved. The bringing together of the machinery and the utilization of this know-how can, however, be accomplished by Europeans. This is where the role of the European consultancies with demonstrable experience will be utilized.

A larger and more explosive market exists in the minicomputer field. It is the first real opportunity for those companies, which have traditionally created revenue on a fee-earning basis, to move into a "product" field.

Barnes is managing director of Systems Programming Ltd.

Warren Named IBM Vice-President

ARMONK, N.Y. – Richard C. Warren has been elected a vice-president of IBM.

Warren will continue as vice-president of IBM World Trade Corp., headquartered in New York City. He was elected to the board of directors of IBM World Trade Corp. in 1971 and was named a member of the World Trade Management Office earlier this year.

Executive Corner

Other Moves

■ Robert H.F. Lloyd, president of Advanced Memory Systems, Inc., has been elected chairman of the company, leaving the president's post vacant. AMS is currently searching for a successor to fill the vacancy.

■ David J. Barber, cofounder of Entrex, Inc., has been elected Chairman of the board of directors for the company. Donald W. Feddersen has been elected Entrex's president and chief operating officer.

■ G. Harry Ashbridge has joined Control Data Corp. as vice-president, planning, for the Control Data Peripheral Products Co. Ashbridge was formerly vice-president, business and market opportunities, for Telex Computer Products, Inc.

■ Lawrence E. Walkley and Robert D. Schmidt have been elected to the board of directors of Control Data Corp. Schmidt heads the international development committee.

■ John F. Manning, treasurer of I-T-E Imperial Corp., has been appointed to the board of directors of Decision Data Computer Corp.

The German Computer Caravan Schedule

Dusseldorf	Nov. 1-Nov. 3
Hamburg	Nov. 6-Nov. 8
Frankfurt	Nov. 13-Nov. 15
Berlin	Nov. 20-Nov. 22
Munich	Nov. 27-Nov. 30

Sell Europe's largest EDP market this November.

The Computer Caravan is a travelling computer users' forum and exposition that has created a whole new form of EDP marketplace, with a proven record of success. Two U. S. Caravans have produced a total attendance in excess of 50,000, and a remarkable sales record. Now we're going to Europe–starting with a four-city English Caravan in September, and a five-city German Caravan in November. Next spring, we'll follow with a French Caravan.

But we're not simply taking our American ideas and customs abroad. We know that the needs of EDP users differ from country to country, and we've arranged for local sponsorship and guidance for each European Caravan.

In Germany, a leading EDP marketing organization, AMS Market Services, will be in charge of Exhibit Management and Sales. Dr. Gerhard Maurer, a widely respected EDP expert, will manage our Forums; and promotional support will be provided through leading EDP trade publications.

Germany is Europe's largest EDP market, and the German Computer Caravan is a unique, new way for your company to increase its sales there. To get a free brochure, just send in the coupon below. We'll send out the details right away.

TO: Neal Wilder
Vice President, Marketing
Computerworld
797 Washington Street
Newton, Mass. 02160
(617) 965-5800

Please send me further details on the European Computer Caravans.

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____

The European Computer Caravans sponsored by COMPUTERWORLD

This coupon is to tempt you.

Please send me **COMPUTERWORLD** for 1 year and bill me later.

☐ U.S. – $9 ☐ Canada – $10 ☐ Other foreign – $25

First Initial	Middle Initial	Surname	
Your Title			T – 340
Company Name			
Send to: Address			
City		State	Zip Code

Address shown is:
☐ Business
☐ Home

☐ Check here if you do not wish to receive promotional mail from *Computerworld*.

COMPUTERWORLD

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

YOUR INDUSTRY

01 Mining/Construction/ Oil & Refining
02 Manufacturing – Computer or data system hardware/peripherals/other associated mechanical devices
03 Manufacturing (other)
04 Utilities/Comm. Sys./Transportation
05 Wholesale/Retail
06 Finance/Insurance/Real Estate
07 DP Serv Bureau/Software/Planning
08 Business Services (except DP)
09 Education/Medical/Legal
10 Federal, State and Local Government
12 Communications/Printing/Publishing
13 Other:

YOUR FUNCTION

01 Corporate Officer
02 Data Processing & Operational Management
03 Data Processing Professional Staff
04 Consultant
05 Lawyer/Accountant
06 Engineering-Management/Scientific/R&D
07 Sales/Marketing/Account Executive
08 Librarian/Educator/Student
09 Other: _____

FIRST CLASS
PERMIT NO. 40760
NEWTON, MASS.

BUSINESS REPLY MAIL No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

797 Washington Street
Newton, Massachusetts 02160

Steel Maker Orders B 7700

LUXEMBOURG – Arbed, a major European steel maker, has ordered a large-scale Burroughs B7700 system for production control, mathematical modeling and scientific research.

Arbed also ordered three B1728 small-scale computers and 24 input and display terminal systems. Total value of the order exceeds $3.8 million.

The B7700 will have two CPUs, two input/output processors and two data communications processors. Installation is scheduled for late 1974.

The B1728s will be installed at three of Arbed's plants and the terminals, installed at various sales points, will be on-line to the B7700 at Arbed's Luxembourg headquarters.

The system also will be used for order entry, numerical control and a variety of administrative and accounting applications.

Foreign Orders & Installations

Other Orders and Installations

Fiat, Italy, has ordered a Univac 1110 computer system, valued at approximately $11.2 million, to replace an 1106 currently used for administrative, statistical and engineering applications. The company will continue to use an installed 1108 for similar applications.

Standard Bank Fund Managers, Ltd., South Africa, has installed a System 70 mutual fund accounting system from Western Operations.

Italian Bureau of Shipping, Genoa, is installing a Univac 9700 for administrative work, ship register filing, ship structure design, and hydrostatic and hydrodynamic calculations.

Ontario Hydro, Canada, has ordered a Univac 1106 II to serve as the core of a Data Acquisition and Computer System (Dacs).

National Data Processing Service Division of the British Post Office has installed a Comp 80 microform composition system from Information International, to be used to publish daily directory enquiry books for telephone operator use.

Car-Mel Survives Plant Fire

CW West Coast Bureau

LOS ANGELES – Car-Mel Electronics, Inc., maker of CRT terminals, has moved into a new, 5,000-square-foot plant following a $60,000 fire in August at its old site.

Byron Cole, vice-president of marketing, said the fire destroyed 50 to 100 units but all documentation was saved.

Deliveries will begin within a month, he said.

The firm was organized in April 1969, and began deliveries last October.

We have a whole new line for You:

(617) 965-5800

Increased business requires increased telephone capacity. So we've installed several new phone lines, and a completely new number. Please write it in your directory, as our old number is no longer operative. This one number connects to all Computerworld departments in our home office: Editorial, Circulation, Advertising, Sales, Research, and The Computer Caravans.

COMPUTERWORLD

INTRODUCTORY OFFER:

MINICOMPUTER REVIEW

A guide for decision makers in all industries who need analytical as well as technical information about minicomputers and the companies that manufacture them.

Over 120 minis reviewed individually:

CONCISE DESCRIPTION with price and date of introduction.

FEATURES of general interest such as Time-Sharing, Process Control, Upward Compatibility, Conversational Languages and more.

HARDWARE CHARACTERISTICS indicating instruction sets, CPU characteristics, speed, capacity, word size and communications capabilities.

RANGE OF PERIPHERALS available for each mini and their storage or throughput capacity.

SOFTWARE languages and operating systems and memory requirements for each.

COMPANY PROFILES include address, financial data, number of mini's sold, and hardware and software of each manufacturer worldwide.

Clear format and uniform layout make the MINICOMPUTER REVIEW easy to use. Well organized categories show the pros and cons of every mini.

About 200 pages, loose leaf bound in a handy pocket size notebook. New equipment updates are issued every 4 months.

A one year subscription is $38.00.
Special introductory offer: $28.50

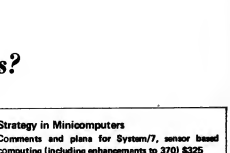
GML Corporation
594 Marrett Road, Lexington, MA 02173
617 861-0515

SIMPLY CLIP AND MAIL

☐ Please send me MINICOMPUTER REVIEW at $28.50/yr.

Name ____
Company ____
Street ____
City ____
State ____ Zip ____

Every EDP supplier should read the Plaintiff's Exhibits of TELEX vs. IBM



But all 14,000 pages?

Lucky for you, IDC's industry analysts – experts in the data processing marketplace – have read and indexed these documents. AND MORE IMPORTANT they have prepared packages in the following areas:

Strategy in Terminals
IBM's sizing and forecast of the marketplace, assessment of competitors, and planned products. Marketing strategy for existing products, pricing considerations, etc. $275

Strategy in Communications Controllers
Same topics as above, including 270x, 3705, 3704. $150.

Strategy in Data Entry
Same topics as above, including OCR, data collection and some unannounced products. $200 (With "Strategy in Terminals," $350 for both)

Strategy in Leasing
Includes specific comments on third party leasing, future systems timetables, competibility, purchase/rent ratios, etc. $225.

Strategy in Minicomputers
Comments and plans for System/7, sensor based computing (including enhancements to 370) $325

Strategy in Computer Services
Specific references to Service Bureau Corporation, $150

Strategy in Autotransaction
IBM's recent announcements of specialized hardware for banking and retailing are just the beginning $175

Strategy in Plug Compatible Tape

Strategy in Plug Compatible Disk

Strategy in Add-On Memory Markets
IBM's strategies to offset efforts of PCM competitors, including references to new products, enhancements to existing products and alternatives to those marketing practices forbidden by the Tulsa decision. $495 each.

IDC

Call Sheri Kern, International Data Corporation
60 Austin St., Newton, MA 02160 (617) 969-4020

IS THE COST OF DOS CICS TOO HIGH?

MINICOMM IS THE ALTERNATIVE.

The cost of CICS may be higher than you think.

Add up the cost of core, education and program development and you may find, as many of the MINICOMM users have, that an alternative exists which costs less, contains greater flexibility, is easier to use, and provides future growth capability.

MINICOMM requires from 3K to 8K of core depending on terminal configuration. Programs may be written in any IBM 360/370 language and executed in a remote and/or local communication environment.

A version of MINICOMM is also available for the small CPU users. Through a unique core sharing technique, MINICOMM Type I will simulate a DOS multi-programming environment, providing on-line CRT capability without adding core and operating concurrently with batch jobs.

All IBM 2260 and 3270 competibles are supported in either local and/or remote mode.

Why not find out more by calling Paul Berens 212-488-7200, or fill out the coupon and mail it today.

PROGRAMMING METHODS
1301 Avenue of the Americas, New York, New York 10019

NAME TITLE
COMPANY
ADDRESS
CITY STATE ZIP
PHONE
COMPUTER

PROGRAMMING METHODS A DIVISION OF GTE INFORMATION SYSTEMS

Memorex Gains Creditor Accord

SANTA CLARA, Calif. – Memorex Corp. has gained some "breathing time" with its major creditors and additional credits through 1973.

A basic agreement reached with Bank of America and lenders to its ILC Peripherals Leasing Corp. subsidiary is designed to "allow Memorex to carry out a projected operating plan which will continue its operations as a viable, ongoing independent business," a spokesman said.

The agreements provide the cash needed to allow the firm's operating cash inflow to exceed its cash outflow, and Memorex expects this situation to occur this month, the spokesman said.

The terms of the agreements, which must be finalized before the end of the year, provide for suspension until 1974 of Bank of America principal repayments, the readvancing of all amounts to be repaid the ILC creditors, and the deferral until the end of 1976 of all cash payments of interest by Memorex and ILC.

The spokesman said that, assuming Memorex meets its projected performance objectives "that will be required by the definitive agreements," cash flow remaining after projected operating expenditures and investments will be essentially equal to specified principal repayments to Bank of America and ILC lenders through 1976.

After that, "meeting scheduled maturities will clearly require financing from other sources or a further extension of debt maturities."

The plan provides for the manufacture of new equipment for lease by Memorex at an annual rate of about $35 million, and a research and development program at about the current $8 million annual rate of expense for the development of disk file storage, communications and media products.

FOR SALE OR LEASE BY OWNER

- S/370 158 New – with ITC and warranty. November delivery.
- S/370-155's with or without DAT. 1 megabyte. 3-year walkaway leases.
- 3360 Model 3's – in 30 days.

Call or Write:
Commonwealth Computer Advisers, Inc.
106 N. Eighth Street
Richmond, Virginia 23219
(804) 643-9123

Honeywell 3d Quarter Earnings Seen Rising

NEW YORK – Honeywell President Stephen F. Keating told analysts he expects the firm's third quarter profit, including special credits, will be between $1.10 and $1.20 a share, up from $16 million or 85 cents a share in the same year-ago period, when a strike in Scotland affected earnings.

"In the information systems or computer business we continue to be encouraged by the rate of improvement from a year ago in revenues, net bookings and net shipments. Each of these indicators continues well ahead of last year's pace," he said.

Ampex Earnings Rise

REDWOOD CITY, Calif. – Boosted by a $278,000 tax credit, Ampex Corp.'s first quarter earnings rose to $872,000 or 8 cents a share, up considerably from the loss of $3.2 million in the year-ago period.

Revenues totaled $62.7 million compared with $55.9 million.

ONLY ONE

Company has:

1. Placed 4 370/158's to 3 customers
2. Sold 2 370/165's to 2 customers
3. Sold 5,000,000 bytes of IBM 3360 storage units to 7 customers

summit COMPUTER CORPORATION

480 Morris Avenue
Summit, N.J. 07901
Phone: (201) 273-6900
Telex: 13-8594

The Computer Caravan welcomes:

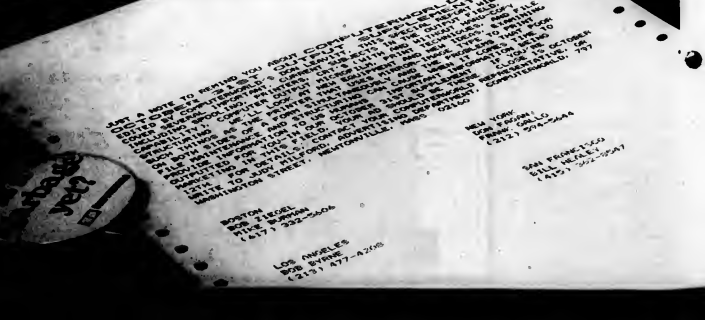
Pansophic Systems, Incorporated

as an exhibitor in The Spring 1974 Caravan.

will show two systems:
1 PANVALET, The Program Management and Security System – A sophisticated servant to handle your program wardrobe.
2 EASYTRIEVE, The File Management and Retrieval System.

What may we say about your company?

The Computer Caravan/74
sponsored by
COMPUTERWORLD
Washington • Cincinnati • Houston • Anaheim
San Francisco • St. Louis • Chicago • Boston
Charlotte • New York
797 Washington St., Newton, Mass (617) 332-5606



POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

PROGRAMMER/ANALYST

Aetna Life & Casualty, world's largest financial organization, headquartered in Hartford has an opening for a programmer/analyst in the Corporation's Computer Department. Applicants must have 2 or 3 years BAL or COBOL experience on IBM 360/370 OS and familiarization with JCL and timesharing. Starting salary $10,500 to $13,500.

Interested? Send detailed resume to:

Craig S. Mackey
Data Processing Recruiter
Aetna Life & Casualty
Hartford, Conn. 06115

An Equal Opportunity Employer

Manager/Analyst Computer Center

Assume active role in analysis and development of administrative systems on 3rd generation time-sharing system. Management, analyst, or programming experience in commercial or educational T/S applications required. Masters degree preferred. Send resume including salary progression to:

W.E. Greenyeach
Director of Personnel
University of San Francisco
2130 Fulton Street
San Francisco, Ca. 94117

An affirmative action equal opportunity employer.

SYSTEMS PROFESSIONALS

The Orkand Corporation a fast growing Management consulting and systems firm has recently expanded into the professional recruitment field. We are currently establishing a variety of assignments with clients both local and national to fill the following needs:

* SYSTEMS PROGRAMMERS—One to six years 360/OS environment; will work on development and implementation of TP systems for large user under 370/VS2, excellent fringe benefits....Salary to $18,000
* DATA BASE ANALYSTS—Experience in design and development of sophisticated data base management systems: IMS, TOTAL, ADABAS, etc. Salary $20,000 to $25,000
* APPLICATIONS PROGRAMMER ANALYSTS—One to six years COBOL, ALC, or PL-1 prefer 360/OS experience; design and analysis for on-line MIS for a major corporation....$12,000 - $18,000.

For immediate and confidential consideration please forward your resume to:

THE ORKAND CORPORATION
Director of Search
8630 Fenton Street
Silver Spring, Md. 20910

COMPUTER SYSTEMS PERFORMANCE MONITORING ANALYST HARDWARE – SOFTWARE

Large consulting organization needs individuals with medium experience using both hardware monitoring devices and software programs to perform computer system measurements.

Send resume including salary history to:

CW Box No. 2939
797 Washington Street
Newton, Mass. 02160

SOFTWARE SERVICES REPRESENTATIVE WANTED

Smaller computer software house, working in financial applications, seeks effective representation to commercial and financial markets.

Inquiries invited from:
* established sales representative,
* sales organization,

familiar with EDP services industry.

Senior individuals with a genuine desire to participate in equity situation given special consideration.

Salary and profit participation arranged.

Write: Miss Prunesu
P.O. Box 33
Auburndale, Mass. 02166

M.I.T.
MANAGER OF SUBSYSTEM DEVELOPMENT

A new position is being created within the Program Development Office at MIT with the title of "Manager Subsystem Development." This manager will provide technical direction of the design, development and maintenance of software subsystems, (e.g., data base, information retrieval, or language subsystems) under the OS/360, OS/VS2, and Multics operating systems.

Candidates should have at least 7 years of professional experience, some experience in large-scale software design, evaluation, implementation and project control, knowledge of more than one operating system and the use of higher level languages, and at least 2 years experience in technical management. The manager will assume full responsibility for the technical management of a small but growing subsystem development group and provide technical management backup for other PDO managment functions, (e.g., the Manager of System Programming).

Please send resume to:

M.I.T. PERSONNEL OFFICE
77 Massachusetts Ave.
Cambridge, Mass. 02139
Attn. Position #73-912

An Equal Opportunity Employer M/F

COMPUTER MEASUREMENT SOFTWARE ENGINEERS

Boole & Babbage is the Industry Leader in software computer measurement and evaluation. We have three outstanding career opportunities for senior professionals to enhance the state of the applied computer measurement and evaluation art.

ANALYTIC COMPUTER SYSTEM MODELING SPECIALIST

Responsibilities will include the development and application of analytic models to predict the effect of hardware and software changes on the performance of the IBM 370 VS2R2 system. Successful candidates will have a PhD or MS in Computer Science or related discipline with prior research experience and a thorough familiarity with current research, particularly in virtual memory systems. Knowledge of probabilistic modeling including queuing theory and stochastic processes required.

SYSTEMS PROGRAMMER

Responsible for the development of software computer and programming system monitors for the IBM VS operating systems. Candidates must have at least 3 years experience developing or modifying the OS or VS operating systems. Detailed knowledge of MVT or VS2 supervisor and IOS internals required.

SCIENTIFIC PROGRAMMER

Responsible for the design and implementation of programs analyzing the performance of IBM VS operating systems. 3-5 years programming experience in scientific or operations theory, matrix algebra, and list processing necessary. BS in math or computer science preferred.

All positions require highly motivated, self-reliant and productive individuals who function well on small professional teams. Superior salary and fringe benefits. Please send your resume including salary history to:

Mr. Thomas M. Hoger, Manager, Software Engineering
Boole & Babbage, Inc.
850 Stewart Drive, Sunnyvale, Calif. 94086

Regional Sales Manager
Data Communications

Intertel has had a successful, profit-making history in the OEM market. Now we're making an aggressive move into the end-user business. That means lots of hard work and a good chance to make a lot of money.

We have an opening for a Midwest regional sales manager. We need someone with experience running a district or regional operation.

You'll sell data communication network management systems (including modems, diagnostic equipment, and network configuration hardware) to Fortune 1000 companies, major banks, airlines, etc.

Call our national sales manager, Neal Dempsey, at (617) 272-7030.

Intertel is an equal opportunity employer.

intertel

6 VINE BROOK PARK, BURLINGTON, MASSACHUSETTS 01803

Expect the best from Signetics.

Challenging careers you should explore on the San Francisco Peninsula.

When considering a job change, you should look to a company that is well respected and growing at a rate higher than the industry average. Signetics Corporation is that kind of company. We are one of the pioneer firms in the booming semiconductor industry. And we have always produced and delivered the best products possible. The same philosophy exists in our employment practices. With us you will have all of the challenge you can take. Check Signetics out now. It will be a move you'll wish you had made long ago.

Engineering Analysis Systems Openings

Systems Analysts

The candidates we select will design process control systems in wafer fabrications areas. Responsibilities will include working with engineers and production people to set yields improvement goels, define problem areas, design and supervise implementation of solutions. You must be an aggressive individual capable of selling your ideas. BS and MBA or MS required plus background in quantitative methods and/or applied statistics for these high growth potential positions.

Programmer Analysts

If you can work independently in a challenging scientific applications area, then consider our offer. You will be required to do detailed systems design and implementation of process control systems. Minimum background should include BS degree with 2 years of experience in PL 1 or FORTRAN.

Commercial Systems Openings

A number of positions exist for programmers and programmer analysts with Systems 370 COBOL experience. Applications include the development of purchasing, personnel and production control systems. These openings require a strong ability in applying sound design and control techniques as you will assign tasks and work with a minimum of supervision. Heavy interfacing with the user is a standard at Signetics. College degree preferred.

At Signetics you will participate in a progressive salary and benefit program. You will enjoy San Francisco Peninsula living where the sun shines over 300 days per year. Excellent universities are close by. And the excitement of San Francisco is less than 45 minutes away.

Submit your resume including salary history and requirements in complete confidence to Professional Employment Director, Signetics Corporation, 811 East Arques Avenue, Sunnyvale, California 94086. We are a subsidiary of Corning Glass Works and an equal opportunity employer, male-female.

signetics

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

PROGRAMMERS

Major Chicago Loop bank is in need of experienced programmers to join our rapidly expanding banking computer systems area.

Successful candidates will have 2 years commercial programming experience in an OS environment using PL 1, COBOL, or BAL. Excellent starting salary and generous company benefits including hospitalization, Life Insurance, Pension Plan and Profit Sharing. Forward your letter or resume including salary requirements to:

CW Box 3942
797 Washington Street
Newton, Mass. 02160

An Equal Opportunity Employer M/F

Software Group Supervisor
IBM 370/155 OS/MVT/HASP

The University of Akron Computer Center has a position open for a Supervisor of the Software Group. Our environment is large-scale OS/MVT with T/P. We are seeking an individual who has 5 years experience in computing and a minimum of three years with maintenance and support of multiprocessing operating systems with a good working knowledge and direct experience with HASP and OS. BS or BA degree required, Master's Degree preferred. Will be involved with software and hardware planning effort and developing operating procedures for entire Computer Center as well as responsible for software maintenance. Supervisory experience or demonstrated supervisory potential required. This is an excellent growth position. This position carries general faculty status and a very liberal fringe benefit program. Send resume or call:

Mr. Robert L. Brisbin
Manager of Academic Systems and Programming
The University of Akron Computer Center
Akron, Ohio 44325 216-375-7172

SENIOR SYSTEMS ANALYST

We have immediate need for a senior systems analyst due to the rapid expanding activities at our Truck Group Staff. The individual we seek must have the ability to analyze existing systems, modify to meet our requirements, and develop and design new systems.

This position affords excellent growth potential, not only in the Truck Group, but throughout our billion dollar international corporation as well. We offer an outstanding compensation program and fringe benefit package.

If you possess business systems experience including a minimum of 2 years in a COBOL environment, can communicate effectively with all levels, and desire a challenging and stimulating opportunity, send detailed resume with salary history to:

Personnel Office
WHITE MOTOR CORPORATION TRUCK GROUP
36129 Curtis Blvd.
Eastlake, Ohio 44094

WHITE MOTOR CORPORATION

An Equal Opportunity Employer M/F

DATA CENTER MANAGER

We have an immediate need for a professional individual capable of managing our large data center complex. This is a challenging opportunity which requires a combination of technical expertise and managerial ability.

At least 8 years of data center operations experience is needed. At least 3 years should be in the capacity of chief data processing officer in an environment featuring multiple computers equivalent to IBM 360/40, 370/135 or larger under OS operating system with tele-communication and RJE functions. This opportunity will include the managerial responsibility for the planning and direction of all operations of 2 data centers featuring IBM 370/145 under DOS/VS and OS/VS 1, data encoding, input/output control, equipment selection and related responsibilities. We offer an outstanding compensation program and fringe benefit package. Send detailed resume with salary history in strict confidence to:

Personnel Office
WHITE MOTOR CORPORATION TRUCK GROUP
36129 Curtis Blvd.
Eastlake, Ohio 44094

WHITE MOTOR CORPORATION

An Equal Opportunity Employer M/F

Happiness is having your classified ad in

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
797 AUSTIN STREET, NEWTON, MASSACHUSETTS

SUPERVISOR
(DATA SYSTEMS)

The U.S. Postal Service is developing a data systems network to be installed in highly mechanized operating plants located in 21 cities throughout the U.S.

To support these systems, we are seeking data system supervisors with proven ability in planning, coordinating and directing the day-to-day operation of real time minicomputer control systems, and off line data processing installations.

The successful candidates will have approximately 3 years in-charge experience in an industrial environment with responsibility for real time and/or business A.D.P. applications.

Submit detailed resume, salary history, and preferred geographic location to:

Executive Recruiter
Code 374-03, Room 8722
U.S. Postal Service
Washington, DC 20260

SYSTEMS PROGRAMMER
UNIVAC 1108/EXEC 8

We are a major west coast based manufacturer of computer peripheral equipment. Our rapid growth has created an exceptional opportunity for a highly qualified systems programmer who is willing to travel nationally. You will be based at our corporate headquarters.

The following experience will be necessary to qualify for this position.

- Extensive experience in Exec 8 operating systems on UNIVAC 1108.
- Operating systems experience on UNIVAC 400 series computers desirable
- Assembly language experience on UNIVAC computers
- Experience in programming for mass storage peripherals
- Experience in working with customers
- Work well independently
- Bachelor's degree preferred.

This is an outstanding opportunity to continue your diversified experience while working with a young, dynamic company.

Send resume and salary history
in confidence to CW Box 3936
797 Washington Street
Newton, Mass. 02160

An equal opportunity employer

Challenging Carreer Opportunity
In Ann Arbor, Michigan

FIELD ENGINEER

THE CHALLENGE:
Perform emergency and preventative maintenance on our Xerox Computer Systems with Rapid Access Data Units, disc units, magnetic tape units, and line printers attached to the central processor.

THE QUALIFICATIONS:
Three years experience maintaining computers and computer peripherals. Experience on Xerox Systems is desired but not an absolute necessity.
Send resume in confidence to:

Arthur W. Johnson

COM-SHARE, INC.

P.O. Box 1588
Ann Arbor, Michigan 48106
1-313-761-4040
An equal opportunity employer

PROGRAMMERS/ANALYSTS

Partial Listing/These are URGENT
SYSTEMS SUPPORT 13 to 20K
IBM 360/370, OS/DOS, HASP, TCAM, BTAM, IMS, ISI good; UNIVAC 1108 EXEC 8 plus
SOFTWARE DEVEL. 11 to 15K
Assembly language & others, any current hardware, RT, interface, compilers.
MINI-COMPUTERS 11 to 15K
Business, engineering and scientific systems. PDP8/11, NOVA and other.

Fee Paid-Resumes held in confidence. Send resume & salary history to Don Kirschitz or call (617) 890-1500.
WINTER, WYMAN & COMPANY
Professional Consultants
470 Totten Pond Road
Waltham, Mass. 02154

INSTRUCTOR in Computer Sciences

for small New England Business College. Degree in education, computer sciences, business administration or related fields acceptable. Master's degree preferred. Business orientation helpful. Send resume.

CW Box 3941
797 Washington Street
Newton, Mass. 02160

Buy Sell Swap

FOR SALE

SERIES 70		
70/35	32K	CPU
70/45	65K	CPU
70/45	131K	CPU
HONEYWELL		
H-200	24K	CPU

Available immediately
Make Offer
CW Box 3943
797 Washington Street
Newton, Mass. 02160

For lease by owner 360/30 E or F

Available Immediately with any features. I/O set and peripherals also available.

EDP RESOURCES INC.
One North Broadway
White Plains, N.Y. 10601
(914) 428-3804

FOR SALE

IBM 2030F #17427
1051, 1052 Incld.
Please Contact

OLIVER & ASSC.
300 Valley Street
Sausalito, Calif. 94965
(415) 332-6262

IBM 370/155 FOR SALE

ALL or PART
Please Contact
Edna McDonald
NEVADA STATE PURCHASING DIVISION
Carson City, Nevada 89701
(702) 882-7475

BUY SELL SWAP

WANT TO PURCHASE

HONEYWELL 200 SYSTEM

Call or Write Van R. Perkins
CIMARRON EQUIPMENT LEASING COMPANY
711 Thurston Nat'l. Bldg.
Tulsa, Oklahoma 74103
(918) 584-0073

FOR SALE

128K Unit Of

IBM CORE

for 360 model 40
Call or Write
Programming Manager
P.O. Box 44
Well Street Station
New York, N.Y. 10005
(212) 285-2992

WE WANT TO BUY Teletype® Model's 28-33-35

Modems — Couplers — Other Data Communication Equipment
WE ALSO SELL THE ABOVE
Call or Write:
DATA COMMUNICATION EQUIPMENT BROKERS, INC.
1900 Thunderbird Street
Troy, Michigan 48084
(313) 689-2840

SALE OR LEASE

360 Systems, 1401 Systems
2400 Tape Drives, 2311 Disk Drives
1620 Systems, 029, 206, 059
All Types Unit Record Equip.
Incl. 082, 083, 402, 407, 514, 519, 557

EQUIP. WANTED

360 Systems, 1401 Systems
Tape Drives
All Types Of
Card Equipment
029, 059, 026

BUY SELL SWAP

For Lease 370/135

Available — 120 Days

Charles Diegas
(212) 956-2858
Steve Zaleskie
(212) 956-4170

Principals Only

Telcott Computer Leasing
Division of James Talcott, Inc.
1290 Avenue of the Americas
New York, N.Y. 10019
Member —
Computer Lessors Association

For Lease 360/65 360/50 360/40

Configured To Your Requirements

Charles Diegas
(212) 956-2858
Steve Zaleskie
(212) 956-4170

Telcott Computer Leasing
Division of James Talcott, Inc.
1290 Avenue of the Americas
New York, N.Y. 10019
Member —
Computer Lessors Association

SPECIAL SALE

360 (30) Sys. I/O, Set — 1401-8K, 1620 Disk Sys., 1443 Printer, 2311 Disk Drives, 729-Tapes

dpa

- DPA with offices in most major cities now offers IBM equipment nationwide.
- 24 reconditioned units ready to shipment.
- Member Computer Lessors Assn.
- Call or Write

DPA Inc. 2838 Farrington St., Dallas, Texas 75207 (214) 637-8950

SYSTEM 360/370 — dearborn computer leasing corporation

A business relationship you can't afford to be without . . .

- Lease Terms to Fit Your Needs
- Field Engineering Support
- Systems Engineering Support
- Well Trained Marketing Staff
- Buy and Sell-360s
- Subleasing
- Member, Computer Lessors Association

Dearborn Computer Leasing Corporation
a subsidiary of Dearborn-Storm
4849 North Scott Street / Schiller Park, Illinois 60176 Area 312 / 671-4410

BEFORE YOU BUY — BEFORE YOU SELL

GO GREYHOUND

WANTED
All 370's 360/65's and 360/50's

FOR SALE
2030F, 2821-1, 2540-1, 1403-N1, and Tape or Disk to your specifications
Immediate Delivery

A member of the Computer Lessors Association

CALL OR WRITE: Director — Equipment Sales
Greyhound Computer Corporation
Greyhound Towers
Phoenix, Arizona 85077 Phone 602) 248-5872

We Need: 1419, MOD 1, 1442-N2

BUY SELL LEASE — FOR BETTER VALUE LOOK TO:

Available: 370/155, 360/50-512K, 360/40-64K, 360/40-128K, 360/40-192K, 360/30-32/64K, At a package: 2401-IV, 2402-IV, 2403-IV.

cac — COMPUTER ACQUISITIONS COMPANY
P.O. Box 80512, Atlanta, Ga. 30341 (404) 458-4425
Stratford Office Park
Matawan, N.J. 07747 (201) 566-5424

BUY SELL SWAP

MAGNETIC TAPE

	1600 BPI recertified	1600 BPI uncertified	800 BPI recertified	800 BPI uncertified
2400	$6.00	$3.50		
1200	5.00	3.00		
mels	thinline	thickline		
IBM	Memorex	Scotch		

released from GEOHYSICAL Archives not work tapes
(713) 772-5557
C.A.R.D.
7575 Bellaire Blvd.
Houston, Texas 77036

FOR SALE OR LEASE
IBM 360/20 SYSTEM
*** D.P. Equipment *** Marketing Corp
260 W. Broadway N.Y. N.Y.
CALL (212) 925 7737 Ext. 1

ACS FOR SALE

1412 Sorter Reader
Avail — Dec

2415-1 Tape Drive
Avail — Now

082, 602, 552, 514
407-A2, 403-A1 w/Cad
083 w/Alpha & File Fd

COMPLETELY REFURBISHED ON M/C AVAIL. IMMEDIATELY.

ACS Equipment Corporation
8535 Airline, S.E. Exit Drive
Houston, Texas 77054
(713) 461-1331

FOR SALE
NOVEMBER DELIVERY
65K 360/30 CPU
1051/1052
Decimal Arithmetic
Selector Channel
Storage Protection
in New York City

tbi — TBI Equipment Div. Time Brokers, Inc. 500 Executive Blvd. Elmsford, N.Y. 10523 (914) 592-4065

Nationwide brokerdealers of DP equipment & computer time

Boston Chicago Houston N.Y. Los Angeles New York City Washington D.C.

IBM 3155 (J00) or J10) 7 OPERATING LEASE FINANCIAL or SALE

'DAT BOX' on order
AVAILABLE IN FOURTH QUARTER
All Inquiries Acknowledged
Reply: CW Box 3925
797 Washington Street
Newton, Mass. 02160

For lease by owner

360/40 G or GF

Floating point. Direct Control. Decimal Arithmetic. Two Selector channels. Storage protect. With or without I/O set end peripherals.

Available Jan. 1974
EDP RESOURCES INC.
One North Broadway
White Plains, N.Y. 10601
(914) 428-3904

BUY SELL SWAP

Current Inventory SALE

All this Unit Record Equipment in stock and ready to ship at money saving sale or lease prices.

RARELY OFFERED
046, 047, 029, 059, 407, A3, 548, 557, 087, 088
MARK SENSE 519
OTHER FINE MODELS:
024, 026, 056, 077, 085, 402, 403, 407, 514, 519, 523, 552, 602, 604, 521, 826

*** D.P. Equipment *** Marketing Corp
260 W. Broadway N.Y. N.Y.
(212) 925 7737 Ext. 1

WANTED NCR-315

Complete Systems Or Components

Data Systems Of California
418 Park Avenue
San Jose, Calif. 95110
(408) 286-4044 Larry Potter

WANTED ALL 360 SYSTEMS

1401, 1440, 2311, 360/30, 360/20, 360/40, 360/25

CORPORATE COMPUTERS, INC.
420 Lexington Avenue, New York, N.Y. 10017 (212) 532-1200

370/145 384K 3 CHANNELS

Available Jan. 1974 For Sale or Lease at 80% IBM MAC

For Quick Action Call
W.H. Colen
(212) 551-7880

SYSTEM 360/50

Terminal, remote processing or on site availability. Convenient downtown location.

Call Donald Gilchrist — 296-5746

Image Processing Inc.
1747 Pa. Ave., N.W., Washington, D.C. 20006

BUY SELL SWAP

WILL BUY One 2314

6 or more spindles and/or 128K IBM CORE for a 2040G

Write to:
Excalibur Products
7710 Computer Avenue
Minneapolis, MN 55435

370/155J

FOR SALE BY OWNER
Available February 15, 1974

1024K IBM Core
5 Channels
DOS Emulator
3210/3215 Adaptors
No. 3274 Direct Control

Contact:
Robert R. Fulk, Director
Data Operations Services
Horace Mann Life Insurance Co.
1 Horace Mann Plaza
Springfield, Illinois 62715
(217) 789-2500

AVAILABLE IMMEDIATELY
BUY • SELL • LEASE 360/370
special prices for quick delivery

360/30	360/40
32K, 64K	128K, 256K
360/50	360/65
CPU only or complete system with I/O units	
360/20	360/65
8K	30 AOS DELIVERY
SYSTEM	2860-3
	2870-1
2420-7S	2401-5S
	2401-1S
	2314-1

THE WORLD'S LARGEST IBM 360/370 DEALER

FOR THE BEST 360 BUY
TURN COMPUTERWORLD UPSIDE DOWN

Condisco Inc.
2200 E. Devon Ave. Des Plaines, Ill. 60018
Telephone 312-297-3640 • TWX 910-233-2476

BUY SELL SWAP

ATTENTION END USERS

7 360/65's for Sale
Delivery:
October thru February
We want to buy 360's, 370's and peripherals.

THE COMPUTER EXCHANGE INC.
8105 Edgewater Dr.
Oakland, Ca. 94621
(415) 638-9005
11 Great Ave.
Great Neck, N.Y. 11021
(516) 466-6500

BUY SELL SWAP

FOR SALE BEST OFFER

IBM 7040 COMPUTER
HARDWARE CONSISTING OF THE FOLLOWING MACHINES:
7106-002 (with 1033, 1049, 3805, 4426, 7288); 1402-002; 1403-002; 1414-001 (with 7614); 1414-004 (with 6025, 7805, 7631); (4) 7330-001; (2) 0729-002
IBM MAINTENANCE CONTRACT SINCE INSTALLATION
Bids Must be In by November 15, 1973
Contact:
MARQUETTE UNIVERSITY PURCHASING DEPARTMENT
1324 W. Wisconsin Ave.
Milwaukee, Wis. 53233
(414) 224-7453

NCR CENTURY DISC PACKS

655 $155.00 each
656 will lease or sell
657 very reasonable

NATIONAL DATA PRODUCTS INC.
P.O. Box 9128
Fort Wayne, Indiana 46809
(219) 747-1502

BUY SELL SWAP

WANTED

BURROUGHS
L SERIES
TC 500, A140, A150
NCR 31, 32, 41, 42
481-482
TRIDEN Computer
B80 B90
Peripherals 7201 2202
7211 7231 7311 7321
Call Stuart Rubenstein
I.O.A. Data Corp.
363 Lafayette St. N.Y. 10003
(212) 673-9300

IBM 729

Magnetic Tape Units
Models II, IV, V and VI

IBM 1401 SYSTEMS

Configured to Your Requirements
Card, Tape, and Disk

IBM 1403 PRINTERS

For Sale or Lease
Immediate Delivery
THE HALSEY CORPORATION
1367 Central Avenue
Middletown, Ohio 45042
(513) 424-1697

MOHAWK KEY TAPES

With Payout Less
Than 15 Months
(4) 1104's - With Adding Machine
(1) 1103 — With Communications
Used Less Than One Year
Make Offer For
Partial or All
Call W.D. Marshall
Interstate Brands Corp.
12 E. Armour Boulevard
Kansas City, Mo. 64111
(816) 561-6600

Are you familiar with one of the large volume data conversion houses in the Midwest?

- Key Punch — Key-to-Tape — Clerical
- Guaranteed delivery — competitive pricing
- Daily service in the major Midwest metropolitan areas

Write for brochure or call collect:
JANESVILLE DATA CENTER, INC.
P.O. Box 43
Janesville, Wis. 53546
(608) 756-2638

360 BUY SELL TRADE 370
• LEASE/SUBLEASE •

AVAILABLE

Central Processors
~~[illegible]~~ 65K loaded 2 chan.
~~[illegible]~~ 32K 1 chan. S/S
~~[illegible]~~ 128K 2 chan.
~~[illegible]~~ ~~Multiplexor~~
Peripherals Readers-Punches
1(4) 1403-N1 Printers
1(1) 2821-1 Controller
~~2540-1~~ ~~Reader/Punch~~
2501-B2 1000 CPM Reader
1442-N2 160 CPS Punch
Disk
~~2314-A1~~ ~~1-4 Spindles~~
~~2311-1~~ ~~1-8 Spindles~~
~~2311-1~~ Controller
(4) 2311-1 Disk
Tapes
2404-3 Control & 30KB drive
2402-3 Two 90KB drives
2401-3 50KB drive
1(6) 2403-2 Control & 30KB drive
2(4) 2401-2 50KB drive
2404-1 Control & 30KB drive
2402-1 Two 90KB drives
2401-1 50KB drive
2415-5 Control & four 3600 BPI drives
(7) 2403 90KB NRZ drives
Misc.
2701-1 Data Adapter
Two 7698 lines
2701-1 Data Adapter
one 7698
~~[illegible]~~ ~~Switching Unit 2-port~~

LUNCEFORD & ASSOCIATES
Valley View Bank Bldg.
Overland Park, Kansas 66212
(913) 381-5272

BUY SELL SWAP

BUY • SELL • RECONDITION TELETYPE®

Machines — New, Used
• Models 26, 32, 33, 35, 38
• BRPE's • CRT's • Cousiers
• Enclosures • Modems
• 10, 15, 30 CPS Terminals
NAT'L TELETYPEWRITER CORP.
23 Cain Dr., Plainview, N.Y. 11803
(516) 293-0444

FOR SALE

360/20
2501A2, 2520A2
1403-2, 2-2311
MAKE OFFER
SYSTEMS MARKETING, INC.
3930 E. Camelback Road
Phoenix, Ariz. 85018
Contact:
Robert R. Russel
(602) 956-8470

Don't discount System/360.
Let us do it for you.
We lease 360-30's and 360-40's at low, low prices.
CPU's and complete systems
Contact us today!
EDP Resources Inc.
One North Broadway
White Plains, N.Y. 10601
Call 914-428-3804

FOR LEASE OR SALE

360-40-G-22580 with features
3237 6980
4427 6981
4457 7520
4460 7920
4462
1052-7
Available Nov. 1973

2401-2-9 Track with features
7160
360-20-8K System
2560
2203
2501
Available Mar. 74

1316-DISK PACKS-$20.00 Lease — $4.00 Month
2316-DISK PACKS-$35.00 Lease — $5.00 Month
2316-DISK PACKS-$75.00 Lease — $7.50 Month

WANTED

360 Systems
1/O Sets
029-B22
029-C22

All Types of
Card Equipment
1401 Systems
Tapes & Controllers

DATA AUTOMATION SERVICES, INC.

7760 N.W. 7th Ave.
Miami, Fla. 33150
305-693-3812

Home Office
4850 Cash Rd.
Dallas, Tex. 75247
214-637-6870

316 W. 26th St.
Los Angeles, Calif. 90007
213-747-0887

BUY SELL SWAP

·LEASE · BUY · SELL·

370 LEASE PLANS
3 YEARS & LONGER
LOWEST RATES

360 PRE-OWNED EQUIPMENT

THOMAS COMPUTER CORPORATION
625 N. Michigan Ave.
Chicago, Illinois (312) 944-1401

BUY • SELL • LEASE IBM 360/370

IPS is the oldest dealer in used IBM equipment in the world. We have an experienced staff, hundreds of satisfied users, and a stable financial base. IPS carries a multi-million dollar inventory and is always prepared to buy or sell 360 or 370 equipment. On any 360 or 370 purchase, sale, or lease, call or write IPS for a realistic and competitive quote.

IPS COMPUTER MARKETING CORP.
467 Sylvan Avenue,
Englewood Cliffs,
New Jersey 07632
(201) 871-4200,
TWX (710) 991-9677

buy·lease·sell

370 & 360 EQUIPMENT

CIS
CONTINENTAL INFORMATION SYSTEMS CORPORATION

BUY·SELL·LEASE 360/20

360 30/40/50 65

370 145/155

1130

ECONOCOM
Division of Cook Industries, Inc.
2185 Democrat Road P.O. Box 18902
Memphis, Tennessee 38118
901-396-8890 or 901-396-8600

BUY SELL SWAP

FOR SALE
360/20
CARD SYSTEM
with 2501
Leasing Dynamics, Inc.
Buy-Sell-Trade-Lease
3101 Euclid Ave.
Cleveland, Ohio
(216) 687-0100

BUY SELL SWAP

1400-360
Specialists in
1401, 1440
360/20, 360/30
Hundreds of Satisfied Users
Free Appraisal Service
BUY-TRADE
SELL-LEASE
Call us last-but Call Us!
CMI CORP.
Area Code 313-
889-0440
16225 E. Warren Avenue
Detroit, Mich. 48224

BUY SELL SWAP

FOR SALE OR LEASE
IBM
1401 SYSTEMS
with or without
Tape Drives & Disks
Savings in thousands
*** D.P. Equipment
*** Marketing Corp
260 W. Broadway, N.Y. N.Y.
CALL (212) 925-7737 (Ext 1)

BUY SELL SWAP

WANTED
TELETYPE® EQUIPMENT
New • Used • Parts
— ALSO —
• Data Terminals • Peripherals
• Mini-Computers • Modems
Contact us for data terminal sales, service, supplies and rentals.
TSC "TERMINAL SYSTEMS INC."
11300 Hartland St.
N. Hollywood, Calif. 91605
213-769-5772 TWX 910-499-2675

BUY SELL SWAP

we buy and sell
IBM Computer Systems
& Unit Record Machines
NCR 31-32-33-396-400
Burroughs - L Series
Statica
84 Kennedy St.
Hackensack, N.J.
07601
(201) 343-4594

BUY SELL LEASE

1410 7074 729's
360/50, 512K, Late 73
370's & 360's
Systems and Components
Minis & Teletypes
EBM 220 HARVEST AVE
STATEN IS., N.Y. 10314
(212) 273-1616

data sales co.
BUY • SELL • LEASE
IBM 360/370
SYSTEM 3 MEMORY

buy • sell • lease • trade
360/370
Computer equipment inc.
4001 Shelard Pl.
Minneapolis, Minn. 55426

USER SELLING
64K 360/30 CPU
1.5 MIC, SER. #16407
IBM MAINTAINED

- SELECTOR CHANNEL
- DECIMAL ARITHMETIC
- FLOATING POINT
- INTERVAL TIMER
- STORAGE PROTECT
- 1401-1440 COMPATIBILITY
- 1051, 1052 TYPEWRITER CONSOLE

AVAILABLE JANUARY 1, 1974

CALL OR WRITE: EDP MANAGER
AMERICAN ELECTRONIC LABS
P.O. BOX 552 LANSDALE, PA. 19446 MS 1262
ABL 215-822-2929
EXT 257
AMERICAN ELECTRONIC LABORATORIES, INC.

ACS
HONEYWELL
1200 – 32K
4 – TAPE
2 – DISC
AVAILABLE NOW
PRICED TO MOVE!!
FOR SALE or LEASE
or LEASE/PURCHASE
All Equipment Inspected
Tested & Guaranteed
Call Bill Earl

DISK DRIVE SALE
2311
MOD 1 or 11
$3500.00

Burroughs
WANTED
L's & TC's
Call Ken at 313-864-7708
Wilson
Business Machines
19166 James Couzens Hwy.
Detroit, Mich. 48235

COMPLETELY REFURBISHED
AND
RECONDITIONED
ELIGIBLE FOR IBM MA

WHO IS... The Major Financial Institution Leasing S/360's And S/370's in the U.S. Today?

First National Boston (FNB) a top-ranking international financial institution with assets of over $6.3 billion, is now leasing IBM S/360 and S/370 computers and peripherals through an FNB affiliate, Randolph Computer Company. FNB's entry into computer leasing now provides the solid financial base required for highly flexible short and long-term computer leasing of IBM computers and peripherals by IBM users.

During 1972, leasing of S/360 and S/370 CPUs and peripherals saved Randolph's computer-leasing customers over $22 million in rentals, ... in just one year. These users of Randolph's computers, who numbered over 1,000 at year-end 1972, ranked in the top U.S. industry decile with small firms as well as large corporations sharing in cost-saving leases from Randolph. Financial institutions, too — the professional money managers — are well represented among the EDP users who analyzed financial alternatives, then selected the most flexible lease plan for them: a plan designed by RCC for their changing needs.

For your up-to-date lease plan, contact RANDOLPH, THE COMPUTER LEASING COMPANY, now:

OFFICES IN ELEVEN CITIES

Northeast:
537 Steamboat Rd.
Greenwich, Ct. 06830
(203) 661-4200
621 Country Club Rd.
Avon, Ct. 06001
(203) 673-8435
20 Cornell Place
Englishtown, N.J. 07726
(201) 446-6300

Midwest
6110 Executive Blvd.
Rockville, Md. 20852
(301) 770-6264

Southeast
1800 Peachtree Ctr.
Atlanta, Ga. 30303
(404) 688-6932

Midwest:
6080 Montgomery Rd.
Cincinnati, Ohio 45236
(513) 793-6000
625 N. Michigan Ave.
Chicago, Ill. 60611
(312) 787-4224

Southwest:
1545 W. Mockingbird Lane
Dallas, Texas 75235
(214) 637-3680

West:
One Wilshire Blvd.
Los Angeles, Ca. 90017
(213) 630-3135
525 University Ave.
Palo Alto, Ca. 94301
(415) 327-2780
530 "B" Street
San Diego, Ca. 92101
(714) 232-6401

RCC

FOR SALE
32 K
360/30 CPU
Decimal Arithmetic
Floating Point
Interval Timer
One Selector Channel
Storage Protector
1051/1052
Available in Jan. '74
System currently under IBM maintenance agreement
CW Box 3930
797 Washington St.
Newton, Mass. 02160

DAS
4858 CASH ROAD
DALLAS, TEXAS 75247
214-637-6570

FOR SALE IMMEDIATE DELIVERY

UNIVAC
SPECTRA 70
70/45 System $95,000
70/35 System $67,500
Tape, Card, Disk, Printer, Video
418-II
100-II & 1005-III Tape
Upper/Lower Case
9200 CARD SYSTEMS UP TO 75% OFF

IBM
360/25 CPU
360/651 CPU
2311/2841 Disk & Ctrl.
2260/2848 Display & Ctrl.
2401-5 Tapes, (Dual Density)
System 3 BI/SYNCH
7094 System
1301 & 729-VI Tapes

HONEYWELL
200 Series Units
CPU, CARD, TAPE, DISK PRINTER, COMMUNICATIONS
115-2 SYSTEM $85,000
32K CPU, CARD I/O,
(3) DISK DRIVES and
1100 LPM Printer

We have DISK PACKS

CALL 617-261-1100

Send for FREE Reprint "Maintenance of Computers"

AMERICAN USED COMPUTER CORPORATION
P.O. BOX 66, KENMORE STATION, BOSTON, MASSACHUSETTS 02215 TWX: 710-321-4388

BUY SELL SWAP

SPECIALISTS IN IBM 360/370, UNIVAC & HONEYWELL PURCHASE & LEASE

- IBM 360/30 89K Many features $1525 per month
- Univac 1108 262K with 3 subsystems Loaded. $24,530 per month
- Univac 70/46 loaded. $12,000 per month
- Univac 9300 16K With 2 tapes. $1326 per month
- Various refurbished 1004's and DLT-1 & DLT-3.

For information on the EDP equipment exchange service contact:
Gary Johnston
Free Appraisal

BUY SELL SWAP

IBM 1401—12.K-One Tape System
OFF-LINE PRINTER
FOR SALE

1401-65 [LOADED] S/n 20226
1403-2 600 Line/Printer
1402-1 Card Rdr/Punch W/ Early Card Read
729-5 7-tr., 800. CPI Tape Drive
1407-1 Console Inq. Sta.
Immediate Delivery-FOB New York

Contact:
Asking $17,950
DATA OPTIONS CORP.
Station Plaza, Hartsdale, N.Y.
Phone: 914-723-3600

Before You Buy, Lease or Sell 360 • 370 • 1401 • IBM Tape Equipment
Please call us about
COMPUTER CLEARING CORPORATION
5600 Arrow, suite 10
Dallas, Texas 75240
Dallas: 214-526-5011
Chicago: 312-692-2100
Immediate delivery from our market place
Lease, purchase, financing

BUY SELL SWAP

OS-HASP INSTALLATIONS

New system for efficient setup and selection of jobs merges into your current operation. No changes to OS/MVT/VS-2, none to user programs. Increases throughput of your setup jobs 50%, reduces operator manual reply activity even more. Immediately flushes jobs with bad JCL. Optional improvement to HASP job-selection algorithm chooses jobs according to (a) their needs for volumes, tape drives, and disk drives and (b) currently unallocated drives.
For full software description and pricing information, write/call:
KETRON, INC
Valley Forge Executive Mall
650 East Swedesford Road
Wayne, Pennsylvania 19087
(215) 687-6300

FOR SALE OR LEASE

024-$360; 026-$1300; 056-$250; 077-$860; 082-$1,000; 083-$2900; 085-$1800; 086-$900; 402-$1300; 403-$1600; 407-$3600; 514-$1300; 519-$1600; 548-$2300; 552-$1500; 557-$3700; 602-$400; 2311 (1) $5000; 729 (5) $2900; 729 (6) $3000; 1446 (1) $1000; 1401 systems $17,500 & $35,000.

THOMAS COMPUTER CORP.
625 N. Michigan-Suite 500
Chicago, Ill. 60611
(312) 944-1401

IFA

IFA FOR SALE
IBM INTEGRATED FILE ADAPTER
IBM Feature 4650
Cost New $28,320
*Replaces Channels 1+4 on 370/145
*Replaces 2314 Control Unit
*Supports up to Eight IBM 2314 Spindles
Available November 1973
Any Reasonable Offer Will be Considered
OTIS ELEVATOR CO.
30 Glenn Street
White Plains, N.Y. 10603
Attn: P. Cobin
(914) 428-5800

FOR SALE OR LEASE
IBM 1410
COMPLETE TAPE AND DISK SYSTEM
BARGAIN PRICED
*** D.P. Equipment *** Marketing Corp
260 W. Broadway N. Y. N. Y.
CALL (212) 925-7737 Ext. 1

Lease Buy Sell
DEAL WITH PROFESSIONALS
IN PLACEMENT OF PRE-OWNED EQUIPMENT
360
Tape, Disk, Terminals, Peripherals
COMPUTER WHOLESALE CORP
Suite 341-344
Metairie, La. 70001
(504) 581-7741

BUY SELL SWAP

SALE/LEASE

360/20's
CI-8K, 1403-7, 2560 A-1
D2-16K, 1442-5, 2501 A-1 – 1403-2
(2) 2311-11, 2415-1
OTHER MODELS AVAILABLE
1401 C 3, 1402-1, 1403-2
360/30's, 40's, 50's with I/O sets
370-145's, 155's

BUY

All model 360/20's, 360/30's, 40's, 50's and 65's
370's and System 3's
All peripherals and unit record equipment

BOSS SYSTEMS
360/370 & SYSTEM 3
FINANCING AVAILABLE
PHILADELPHIA (215) 568-6620
NEW YORK (516) 487-9812
505 Northern Blvd.
Great Neck, N.Y., 11021

WE WANT TO BUY MINI COMPUTERS

and Peripherals
WE ALSO SELL THE ABOVE
CALL OR WRITE FOR FREE BROCHURE
NEWMAN COMPUTER EXCHANGE, INC.
222 North Seventh
Ann Arbor, Michigan 48103
(313) 761-0984

END USER WANTS TO PURCHASE

1 – 360/40 H or 360/50 H
1 – 2314 Model 1 or A Series
4 – 2401 Model 4 or 5
1 – 2804 Model 2

Please state serial number of equipment, features, availability date and price. Principals Only. Contact:
CW Box 3837
787 Washington Street
Newton, Mass. 02160

FOR SALE

22,000 IBM Magnetic Tape Reels & Cartridges. Used with IBM 7340 Hypertapes. Originally sold for $150./Unit. Like new. Any reasonable offer accepted.

Contact Donald Smith
90 Ridgecrest Rd.
Stamford, Conn.
@ (203) 322-9850
or (212) 582-8520

FOR SALE

Univac 9480
Honeywell 200
6 IBM 2401-02

WANTED

1106 Memory
8414 Disks
Fastrand Drums
Call
UNIT RECORD SERVICE
84 Cummings Park
Woburn, Mass.
Call (617) 933-5348

BUY SELL SWAP

WE PURCHASE 360/20/30
WE LEASE & SELL 360/20/30

THIS WEEK 029 B-22
SPECIALS: 059 M-2

For Sale
029, 059, 082, 084, 026, 557
All 360/20 Systems

SOLIDITY CORPORATION
257 W. 39th Street
New York, N.Y. 10018
(212) 594-9410

WANTED IMMEDIATELY USED HARDWARE MONITOR FOR COMPUTER SYSTEMS MEASUREMENT

Please reply to:
CW Box 3840
787 Washington Street
Newton, Mass. 02160

360-370 marketplace

BUY • SELL • LEASE

TLW COMPUTER INDUSTRIES INCORPORATED

BRANCH OFFICE:
222 E. Wisconsin Ave.
Lake Forest, Ill. 60045
(312) 295-2030

BRANCH OFFICE:
3031 Tisch Way
Executive Suite 13
San Jose, Calif. 95128
(408) 249-0110

3570 AMERICAN DRIVE • ATLANTA, GEORGIA 30341 • 404/451-1895

FOR SALE OR LEASE

IBM 360/30	Serial No. 17378 32K or 65K memory
IBM 360/40	Serial No. 21478 128K or 196K memory
IBM 2803/1	Serial No. 11782 Tape Controller
IBM 2401/3	8 tape drives — 90K8, 800 BPI
IBM 360/44	Serial No. 11113 256K processor, commercial feature
IBM Core	For IBM 360/30 & 360/40

All equipment maintained by IBM. Available Oct. 15, 1973. For further information contact R.A. Forsyths.
Forsythe/McArthur Associates, Inc.
919 N. Michigan Avenue
Chicago, Ill. 60611
Telephone: 312/943-3770 Talex 25-5161

Time for Sale

ILLINOIS

NEED TIME

360/65 DOS 512 K
with 7080 Emulator
12 Tape Drives
16 2314 Disk Drives
On and Off Line Printers
Interested in Selling Block Time
Five or Seven Days a Week
Located in Chicago Central Business District
Excellent Physical Facilities
Will Provide Office & Storage
Call (312) 225-6800, Mr. Zimmer

360/65 OS-MVT-HASP

We will give flat price contracts on jobs regardless of how much running time is involved.

HF/II	APT	MPSX
ICES	BLISS	CROSSTABS
PICS	PAYROLL	SSP
MPS	PLAN	SAS
	BMD	

PROJECT II
ACCOUNTS PAYABLE
ACCOUNTS RECEIVABLE
GENERAL LEDGER
General Purpose Simulation System
Continuous System Modeling Program
Urban Transportation Planning System 360
Block Time and Remote Batch
Your Programs or Ours

USE OUR NETWORK OF BATCH TERMINALS AND 4800 BAUD LEASED LINES CONNECTING THE FOLLOWING CITIES:
- CHICAGO
- NEW YORK
- CLEVELAND
- ST. LOUIS
- MILWAUKEE
- LOS ANGELES

StateCom
A Division of Statistical Tabulating Corp.
(312) 346-7300
Jim Hancock

THE ONLY DIFFERENCE IS THE MONEY YOU SAVE

HOME OFFICE

Evergreen Computer and Financial, Inc.

BRANCH OFFICES

TIME FOR SALE | TIME FOR SALE | SOFTWARE FOR SALE | SOFTWARE FOR SALE | SOFTWARE FOR SALE

ILLINOIS

IBM 360 370 USERS

Equipment Marketplace

2 meg, 2 3330 (16m), 3 2314 (23m), 10 3420-5 tape, 2 1403, 3211.
OS/VS2, RJE, HASP, TSO, DOS emul.
24 Hours — 7 Days
CAN YOU BEAT
7.2 cent/sec for a 60K region?

370/155
2 meg, 3330 (8m), 2314 (8m), 10 3420-5 tape.

	8am–5pm	5pm–8am
Weekdays	Not Avail	$135/hr.
Weekend	$95/hr.	$85/hr.
12 hr. block	$85/hr.	$75/hr.
weekend		

370/135
144k, 1 2314, 4 2311, 8 3420-5 Tapes

	8am–5pm	5pm–8am
Weekdays	$85/hr.	$56/hr.
Weekends	$40/hr.	$35/hr.
12 hr. block	$35/hr.	$30/hr.
weekends		

370/135
240K, 4 3330's, 1 2314, 6 2401-6 Tapes
- Rates same as 370/135 above

360/30
64K, 6 2401 Tapes, 5 2311's

	8am–5pm	5pm–8am
Weekdays	$45/hr.	$35/hr.
Weekends	$25/hr.	$25/hr

FOR FURTHER INFORMATION CALL PAUL FARRIS or RON ELLIS (312) 346-1331

computer research corporation
200 N. Michigan Av.
Chicago, Ill. 60601
Largest Computer Time Sales Company

ARIZONA

CDC-6400

Interactive T/S, Remote and Local Batch
CalComp Plotting
24 hours - 7 days

Extremely Attractive Rates for Block, Overnite and Weekends

Adtesearch — A Signal Co.
402 S. 36 St. Phoenix, Az. 85034
for further information call
R.K. Naumann 602-267-3400

CONNECTICUT

COMPUTERISTIC S
SUBSIDIARY OF
UNIROYAL
COMPUTER PROCESSING SERVICES
360/65 • 1256K • OS
HASP RJE
360/50 360/40 360/30
BATCH PROCESS
Call Collect:
Cal Gould (203) 573-3000
George Erice (203) 573-2587

NEW JERSEY

POPULAR SERVICES, INC.

S/370 145-135-125
S/360 50- 40- 30

1287 OPTICAL SCANNER
2671 PAPER TAPE READER

ALL SHIFTS
(201) 471-2577

MASSACHUSETTS

Computer Time

Honeywell 1250 49K
7 Tape Drives
Card Reader
Console
On and Off Line Printer
Interested in selling
blocks of time.
Located in East Cambridge.
Call Mike DeVitto
354-7000

systematic data processing services, inc.
IBM 370/155
DATA CENTER
OS MVT Release 21.6
2 Million Bytes Main Storage
3330 and 2314 Disks
9 & 7 Track Tape
HASP 111 Remote Job Entry
Key Punching Services
Honeywell DDP-516
24 Hours a day, 7 days a week
Call Sales Dept. 890-1200
S.D.P.S.
400 Totten Pond Road
Waltham, Mass. 02154

Software for Sale

AUTOCODER & SPS TRANSLATED AUTOMATICALLY to BAL & PL/1

THE TOTALTRAN SYSTEM

... The most economical, practical and quickest method of converting to the 3rd and 4th generation.

3 SERVICES OFFERED:
1. 1400 Object to clean source decompilation
2. 1400 Clean source to BAL translation
3. 1400 Clean source to PL/1 translation

Contact: W. Smith, President

CPU MANAGEMENT ADVISORY CORP.
415 Broadway, N.Y. 10013
(212) 777 7722

Paymaster Remedies Payroll Problems

- a comprehensive payroll system
- now serving over 1000 companies
- license for as low as $250 a month
- up to 20 customized deductions and/or allowances . . . all with Y-T-D totals
- handles piecework, including calculations of make-up pay
- accepts input from time cards
- accepts input from terminals
- integrated job costing
- labor distribution
- integrates personnel/payroll records
- completely compatible with IBM 360/370 batch and RJE; Honeywell 200/2000; and Burroughs 1700–4700
- available to companies, institutions and service firms under licensing or purchase

COMTECH
the computer package people
P.O. Box 764 Reston, Va. 22070
Telephone (703) 471-7141

MAIL-ALL

A complete mailing and list maintenance system that:
- Updates-Purges-Selects
- Labels-4 Up-2 Up-1 Up
- Personalized Letters
- Statistical Analysis & Reports

30 DAY TRIAL-ONLY $660
Medical billing, payroll, A/R and A/P also available from:
Occidental Computer Division of ECS
805 S San Fernando Road
Burbank, Calif. 91505
call (213) 843-2722 or 848-1584

ACCOUNTING SYSTEMS

PAYROLL
GENERAL LEDGER
ACCOUNTS PAYABLE
INVENTORY
ACCOUNTS RECEIVABLE

Contact software for details

ACCOUNTING IV

THE FINEST GENERAL LEDGER AND FINANCIAL REPORTING SYSTEM AVAILABLE

Featuring:
- Conventional Report Generator
- Graphic Report Generator
- Matrix Report Generator
- Responsibility Reporting
- Flexible Budgeting Module
- Multiple Currency Version to accommodate foreign subsidiary accounting

informatics inc
Contact: Ron Rugherman
[illegible]
New York (212) [illegible]
New Jersey (201) 402-2100

TAXBREAK

Payroll tax calculation module

Calculates payroll withholding taxes for 50 states, federal, FICA and cities. COBOL. $875 complete.

Maintenance service on tax changes available for $225 per year.

ARGONAUT INFORMATION SYSTEMS, INC.
Post Office Box 112
WALNUT CREEK, CA 94596
(415) 937-4675

COMPUTERIZED ACCOUNTS RECEIVABLE

Features
1. Automatic Cash
2. Multi-divisional
3. Cash forecasting
4. Dunning notices
5. Unearned discount
6. Dunning
7. Audit trails
8. Customized aging
9. Automatic charge-back
10. Cash tear-sheet
11. Suspense accounts
12. Expanded credit
13. Gendret ledger totals
14. Marginal account reports
15. Credit interchange
16. On-line cash
17. Real-time credit inquiries

Benefits
Eliminate all these headaches:
1. You Title
2. Late statements
3. Dna cash card per invoice
4. Extensive clerical effort
5. Unknown credit risks
6. Unclear detailed non-exception reports
7. Unaware credit managers

COMPUTER SYSTEMS & EDUCATION CORP.

David Sheffin
111 Ash Street
E. Hartford, Conn. 06108
(203) 528-6211

Thomas Wentz
560 Hinckley Road
Burlingame, Calif. 94011
(415) 697-3317

CSEC

McCORMACK & DODGE CORPORATION

HAS
DEVELOPED
MARKETED
MAINTAINED

Accounting-oriented software products over the past five years.
Over 400 companies in the U.S. are using one or more of the following:

Fixed Asset Aanlysis & Accounting System
Accounts Receivable System
Investment Analysis System

McCORMACK & DODGE CORPORATION

One Wells Avenue
Newton, Mass. 02159
(617) 965-3750

CATS-A/R

OPEN ITEM ACCOUNTS RECEIVABLE
Features Include:
- Billing
- Automatic Cash Application
- Inventory Interface
- Multi-company Systems Schedule

Under control of the CATS MASTER System Controller, provided FREE with the license of any of the CATS programs. Also available are Accounts Payable-Cash Requirements, Accounts Receivable-Retail System, and Inventory Reconciliation.

For information contact:
Tom Leonard, President
CATS, Inc.
[illegible] Jefferson Avenue
P.O. Box 2222 • Phone 206-752-4391

450 COMPANIES HAVE GAINED THE COMPETITIVE EDGE WITH MSA SOFTWARE PACKAGES

- Industry User Groups
- IBM, Burroughs RCA, Honeywell, ICL
- Warranted Performance
- Exceptional Documentation
- Continued Enhancemants

USER ACCEPTANCE BY PRODUCT
PAYROLL/PERSONNEL-175
GENERAL LEDGER-70
FIXED ASSETS-140
ACCOUNTS PAYABLE-80
INVENTORY CONTROL-15
(Announced 1/73)

Write or Call to Compare
William M. Graves
Management Science America
3445 Peachtree Road, N.E., Suite 1300
Atlanta, Ga. 30326

MSA

Atlanta	404–262-2376
New York	201–871-4700
Chicago	312–323-5940
Los Angeles	213–277-8411
San Francisco	415–328-1700

Computerworld Sales Offices

Vice President—Sales: *Neal Wilder.* Sales Administrator: *Dottie Travis.* Computerworld, 797 Washington St., Newton, Mass. 02160. Tel: (617) 965-5800.

Northern Region Manager: *Robert Ziegel.* Account Manager: *Mike Burman.* Computerworld, 797 Washington St., Newton, Mass. 02160. Tel: (617) 965-5800.

Eastern Region Manager: *Donald E. Fagan.* Account Manager: *Frank Gallo.* Computerworld, Suite 1511, 225 W. 34th St., New York, N.Y. 10001. Tel: (212) 594-5644.

Los Angeles Area: *Bob Byrne.* Robert Byrne & Assoc., 1541 Westwood Blvd., Los Angeles, Calif. 90024. Tel: (213) 477-4208.

San Francisco Area: *Bill Heeley.* Thompson/Heeley Assoc., 1111 Hearst Bldg., San Francisco, Calif. 94103. Tel: (415) 362-6547.

Japan: *Ken Suzuki.* General Manager, Demps/Computerworld, 1-11-15 Higashi Gotande, Shinagawe-ku, Tokyo 141.

Quantor's Expanding Salesmen Wanted

For Boston, New York City, and Washington D.C.

Quantor, the fastest growing company in the Computer Output Microfilm (COM) Industry, is expanding it's marketing efforts in Boston, New York City and Washington D.C.

No experience required in COM Industry. The Quantor COM System is a computer peripheral. Computer System selling experience is desirable.

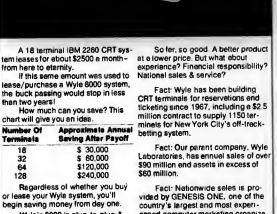
Anticipated annual earnings in excess of $25,000.

Call Dick Coe, National Sales Manager, at our New York office (212) 279-3280 for appointment and interview.

Quantor

520 Logue Avenue, Mountain View, California 94040 (415) 965-3700,
Oak Brook (Chicago) (312) 654-3720, New York, N. Y. (212) 279-3280,
Washington, D. C. (703) 960-3707, Los Angeles, Calif. (213) 649-3634,
Miami, Fla. (305) 448-3650, Atlanta, Ga. (404) 237-1178,
Houston, Texas (713) 772-1772, Philadelphia, Pa. (215) 643-2280

The buckpassing stops here:



A 18 terminal IBM 2260 CRT system leases for about $2500 a month—from here to eternity.

If this same amount were used to lease/purchase a Wyle 8000 system, the buck passing would stop in less than two years!

How much can you save? This chart will give you an idea.

Number Of Terminals	Approximate Annual Saving After Payoff
16	$ 30,000
32	$ 60,000
64	$120,000
128	$240,000

Regardless of whether you buy or lease your Wyle system, you'll begin saving money from day one.

Wyle's 8000 is plug-to-plug & software compatible with IBM 360/370 systems. With more features for less dollars.

Such as 1920, 960 or 480 character screen capacity, up to 9600 bps data rate, non-destructive cursor, colon-seeking tab, special editing keys, character-address, format protect, repeat key. Plus options including: columnar tab, lower case, function keys, numeric pad, hard copy printer and built-in data set.

So far, so good. A better product at a lower price. But what about experience? Financial responsibility? National sales & service?

Fact: Wyle has been building CRT terminals for reservations and ticketing since 1967, including a $2.5 million contract to supply 1150 terminals for New York City's off-track-betting system.

Fact: Our parent company, Wyle Laboratories, has annual sales of over $90 million and assets in excess of $60 million.

Fact: Nationwide sales is provided by GENESIS ONE, one of the country's largest and most experienced computer marketing organizations with offices in 40 major cities Also nation wide service for full customer support.

So get the whole story of the Wyle 8000. Write for our brochure Or better yet, phone the GENESIS ONE office nearest you.

GENESIS ONE

WYLE COMPUTER PRODUCTS, INC.
A Subsidiary of Wyle Laboratories
128 Maryland St El Segundo CA 90245 (213) 678-4251

First Quarter Loss

Mohawk Scores Record Revenues

UTICA, N.Y. – Despite record revenues for the year ended July 31, Mohawk Data Sciences Corp. (MDS) incurred a loss of $1.3 million compared with earnings of $289,000 in 1972.

The loss was "disappointing," President Richard P. Rifenburgh said, especially in view of the record revenues and success in implementing cost reduction programs.

Operating Net Up

"Income before interest and taxes on income actually increased 26% over last year's first quarter, but extremely high interest costs combined with the unavailability of domestic tax credits to offset foreign income taxes impacted us severely," Rifenburgh remarked. "The domestic tax credits will be available to MDS on a carry-forward basis," he added.

Revenues reached nearly $41 million, compared with $33.5 million a year ago.

Rental and service income rose to $23.5 million compared with $19 million a year ago. Sales increased to $17.5 million from $14.4 million in 1972, when MDS sold about $3.2 million to Randolph Peripheral Corp.

The figures for 1973 include results of operations of Elastofabs Corp. and Computing Efficiency, Inc., acquired in January and March this year.

The firm is continuing to make progress in penetrating its market, Rifenburgh said.

Deliveries of the System 2400 continue strong and Rifenburgh added he is confident the new System 2300, with deliveries starting in November, "should penetrate a good share of data capture and document preparation market, which is estimated at 100,000 units by 1977."

The recent court decision in the IBM-Telex case, if upheld, "promises in the long run to be beneficial to MDS since many of our products are in competition with equipment manufactured by IBM."

Pertec 1973 Earnings Decline

LOS ANGELES – Rising revenues and declining earnings were the story st Pertec Corp. for the year ended June 29. Increased costs for engineering, marketing and production startup for new products and the result of the proxy contest were reasons for the decline in earnings, a according to President Ryal R. Poppa.

Earnings were off to $1.6 milion or 54 cents a share from nearly $2 million or 64 cents a share in 1972.

Revenues climbed to $27.4 million from $22.9 million, and reflected increases in all segments of the firm's business, Poppa said.

The 1973 results include an extraordinary credit of $12,000, the difference between $80,000 for proxy contest expenses and a $92,000 tax loss carryover stemming from an acquisition in 1970.

The firm reduced its provision for income taxes by $255,000 as a result of the Domestic International Sales Corp. Act, Poppa said. About half of Pertec's products are shipped to foreign markets, either directly or through its customers.

Pertec makes tape and disk drives, key-to-tape systems, COM systems and line printers.

WANTED FOR ACQUISITION

New York based computer service companies with contractual computer processing clients. Sales range $200,000 and up. With or without hardware. Need not be profitable. All inquiries answered and will remain confidential. President

Box #3938
797 Washington St.
Newton, Mass. 02160

frequency division multiplexer

FEATURES . . .

INDICATORS: Multi-colored display panel provides indication of four control and two data functions.

MULTI-DROP: Drop one or more channels at a number of locations.

MULTIPLE ACCESS: Multi-drop channels have equal opportunity contention for processor channels.

BUSY-OUT: Busy-Out control of remote modems.

LOOP-BACK: Test features provide rapid system diagnostics.

DATA RATES: Mix 110, 150 and 300 baud channels.

CONTROLS: Processes all modem control functions.

VOICE-PLUS-DATA: Simultaneous voice channel with four data channels.

OPTIONS: Many other optional features.

SAVE 4-WAYS

1. No high speed modems required.
2. No private line conditioning required.
3. Modular construction permits starting with one channel and adding others as needed.
4. Eliminate long distance phone calls with voice-plus-data.

$465 BASIC UNIT — $15.80 PER MONTH*

$325 PER CHANNEL END — $11.00 PER MONTH*

*3 Year Lease with Purchase Option

Send for FREE Brochure today.

Data Channel Concentrators and Expanders, Modems, Line Test Units and other Data Communication Equipment

CodeData Corporation IDCMA

Earnings Reports

TECHNITROL
Three Months Ended June 30

	1973	1972
Shr Ernd	$.10	.....
Revenue	2,586,291	$964,155
Earnings	143,969	(61,436)
6 Mo Shr	.15	.....
Revenue	4,968,779	2,229,642
Earnings	214,406	(21,697)

EX-CELL-O
Nine Months Ended Aug. 31

	1973	1972
Shr Ernd	$1.50	$.39
Revenue	245,070,000	204,967,000
Spec Chg	.....	a3,000,000
Earnings	12,513,000	3,300,000

a-From phase-out of product lines of EXO Computer products.

COMPUTER INSTRUMENTS
Six Months Ended July 13

	1973	1972
Shr Ernd	.....	$.02
Revenue	$2,409,530	2,472,283
Earnings	(149,520)	32,638

SCIENTIFIC COMPUTERS
Year Ended June 30

	1973	1972
Shr Ernd	$.14	$.21
Revenue	3,773,326	3,684,722
Earnings	112,975	172,516

KEANE ASSOCIATES
Three Months Ended June 30

	1973	1972
Shr Ernd	$.11	$.08
Revenue	1,018,000	752,000
Earnings	96,000	66,000
6 Mo Shr	.22	.18
Revenue	1,973,000	1,498,000
Earnings	187,000	129,000

DIGI-LOG SYSTEMS
Three Months Ended June 30

	1973	1972
Shr Ernd	$.10	$(.11)
Revenue	615,750	82,160
Earnings	60,768	(46,404)
9 Mo Rev	1,000,062	193,696
Loss	104,946	131,168

ELECTRONIC TABULATING
Six Months Ended June 30

	1973	1972
Shr Ernd	$.33	$.06
Revenue	1,167,206	870,321
Spec Item	100,000	.....
Earnings	194,745	34,805

MENTOR
Year Ended June 30

	1973	1972
Shr Ernd	$.12	$.21
Revenue	4,720,219	3,205,480
Tax Cred	45,000	135,000
Earnings	201,552	279,524

DATAMATION SERVICES
Six Months Ended June 30

	1973	1972
Shr Ernd	$(.08)	$.05
Revenue	1,059,351	1,313,536
Earnings	(97,574)	56,263

C3
Three Months Ended June 30

	1973	1972
Revenue	288,561	96,618
Earnings	39,216	(137,216)

DATA DISC
Three Months Ended June 29

	1973	1972
Shr Ernd	$.19	$.15
Revenue	2,596,917	1,664,299
Earnings	196,194	114,974
6 Mo Rev	.37	.29
Revenue	5,136,752	3,084,846
Earnings	386,306	226,243

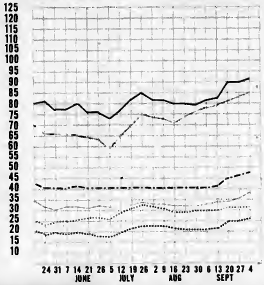
SYSTEM DEVELOPMENT
Year Ended June 24

	1973	a1972
Shr Ernd	$.80	$.69
Revenue	72,435,000	51,514,000
Earnings	1,531,000	1,239,000

a-Restated for pooling-of-interests.

COMPUTERWORLD Computer Stocks Trading Indexes

— Computer Systems
----- Software & EDP Services
.... Peripherals & Subsystems
.... Leasing Companies
.... Supplies & Accessories
-·-·- CW Composite Index



* WANTED *

Firms to: Buy / Sell / Lease / Sub-Lease → 360 Systems

Write or Call Collect — Today
Its our only business

NVC COMPUTER SALES, INC.
Suite 616, Benjamin Fox Pavilion
Jenkintown, Pa. 19046 • (215)-887-5404

STORE MORE. PAY LESS.

IBM 3360's
More storage for your 370/155 or 370/165 at much less cost. Lease 1 to 5 years or purchase. Delivery guaranteed to meet your specific needs.

alanthus
Alanthus Corporation
77 Tarrytown Road
White Plains, New York 10607

For further information, call (914) 428-3703 or write:
Name
Title
Company
Address
City
State Zip
Phone No.

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		PRICE 1973 RANGE (1)	CLOSE OCT 4 1973	WEEK NET CHNGE	WEEK PCT CHNGE
	COMRUTER SYSTEMS				
N	RURPOUGHS CORR	211-245	227 1/8	-10	-4.2
N	COLLINS RADIO	1P- 28	24 1/2	- T/R	-3.A
O	COMRUTEP AUTOMATION	5- 1P	10	+3 1/2	+24.1
N	CONTROL DATA COPR	31- 62	46	+1	+2.2
O	OATA GENERAL CORP	20- 46	AS 1/4	+2 1/4	+5.2
O	OATAROINT CORR	10- 21	17 5/8	+ 3/4	+4.4
O	OIOITAL COMP CONTROL	2- P	3 1/8	+ 1/4	+8.6
N	OIBITAL EQUIPMENT	73-105	98 1/2	-5 3/8	-5.1
N	ELECTRONIC ASSOC.	4- 9	5 T/R	+1 1/8	+23.8
A	ELECTRONIC ENOINEER.	P- 12	11	+ 1/2	+4.7
N	FOXPORO	23- 45	44	- 3/4	-1.8
O	GENERAL AUTOMATION	22- 55	38 1/2	- 3/4	-1.9
O	ORI COMPUTER CORP	1- 3	1 1/2	- 1/8	-T.8
N	HEWLETT-PACKARO CO	T3- 95	90 3/A	+3 1/A	+3.7
N	HONEYWELL INC	90-139	110 3/P	-3 3/8	-2.9
N	1RN	249-340	2S1 1/2	-P 1/2	-3.2
O	INTERDATA INC	7- 14	13	+1 1/8	+9.4
N	MENORFX	2- 19	3 7/8	-1	-20.5
O	MICRODATA CORR	2- 10	3 1/2	- 1/A	-6.P
N	NCP	27- 42	A1 1/4	+2	+5.0
N	RAYTHEON CO	22- 34	31 1/2	+3 3/4	+13.5
N	SINOER CO	45- T4	58	+1	+1.8
N	SRERPY PANO	36- 53	52 3/8	+1 3/8	+2.8
A	SYSTEMS ENO. LARS	3- R	3	- 1/8	-A.0
N	TEXAS INSTRUMENTS	83-12P	125 1/4	+A 1/4	+3.5
O	ULTINACC SYSTEMS INC	1- 11	2 3/0	- 1/8	-5.0
N	VAPIAN ASSOCIATES	10- 20	1T 1/4	+ 1/2	+2.9
N	WANG LAOS.	13- 34	20 1/4	+5 5/8	+24.R
N	XEROX COPP	130-169	137 3/4	-8	-5.4
	LEASINO COMPANIES				
A	BOOTHE CONPUTER	1- 9	1 1/8	0	0.0
O	BRESNAHAN COMP.	1- 2	2 1/8	0	0.0
O	CONOISCO INC	P- 1T	7 3/A	+1 1/8	+1P.9
O	CONMERCE GROUP COPR	3- A	3 1/2	- 1/8	-3.A
O	COMRUTEP EXCHANGE	1- 1	1/4	0	0.0
A	COMPUTER INVSTPS GRP	2- R	2 7/8	+ 1/4	+9.5
O	CONR. INSTALLATIONS	1- 2	1	0	0.0
M	OATPONIC PENTAL	2- 3	2 3/8	+ 1/A	+11.7
A	OCL INC	1- 3	1	0	0.0
A	OFAPBORN-STORM	12- 26	15 1/4	- 1/8	-0.8
N	ORF INC	5- 9	5 1/4	0	0.0
O	EDR RESOURCES	1- 3	1 1/4	- 1/8	-9.0
A	GHANITE MOT	2- 6	4 3/8	0	0.0
A	OPEYMOUND COMPUTEN	3- 8	A 1/8	- 5/8	-13.1
A	ITEL	A- 12	P	+ 5/8	+11.6
N	LEASCO CORP	8- 18	13 1/R	+ 1/4	+1.9
O	LEASPAC CORP	1- 8	1 1/4	+ 1/A	+25.0
O	LECTPO NOT INC	1- 2	5/R	- 1/8	-10.6
O	NRO INC	5- 15	6 3/8	+ 5/8	+10.P
A	PIONEER 7EX CORP	5- P	5 5/8	0	0.0
A	ROCKRDOO CONRUTER	1- 3	1 1/4	+ 1/8	+11.1
N	U.S. LEASINO	18- 3P	2P 3/R	+ 3/8	+1.A

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASN
L=NATIONAL; M=MIDWEST; O=OVEP-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		PRICE 1973 RANGE (1)	CLOSE OCT 4 1973	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EOR SERVICES				
O	AOVANCFO COMR TECH	1- P	1 1/2	+ 1/8	+9.0
A	APPLIEO DATA RES.	2- 4	2 1/4	- 1/4	-10.0
O	ARPLIFD LOGIC	1- 3	T/8	0	0.0
N	AUTOMATIC DATA PROC	39- 94	75	+2 3/4	+3.8
O	PRANDON APPLIEO SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	6- 9	P 1/2	- 1/4	-3.7
O	CONRUTER OIMENSIONS	2- 5	3	+ 3/4	+33.3
O	CONPUTEP OYNAMICS	1- P	3/P	0	0.0
O	COMPUTER HORIZONS	1- 6	3 1/2	+1	+40.0
O	COMPUTER NETWORK	1- 5	1	0	0.0
N	COMRUTER SCIENCES	2- 6	3 3/R	+ 1/8	+3.8
O	COMPUTEP TASK BPOUR	1- 2	1 1/2	0	0.0
O	COMRUTER TECHNOLOGY	1- 3	1	0	0.0
O	CONPUTER USAGE	A- 9	5 1/2	+ 3/8	+T.3
O	COMPESS	1- 2	1/2	+ 1/8	+33.3
O	COMSHAPE	4- 9	4 1/4	0	0.0
N	COPOURA COMP	4- 15	S 3/P	+ 1/2	+10.2
O	CYPERMATICS INC	1- 3	1 5/8	+ 1/4	+18.1
O	DATATAP	1- 4	1 1/2	0	0.0
A	ELECT COMP PROG	1- 2	1 1/8	+ 1/4	+28.5
N	ELECTRONIC DATA SYS.	29- 56	40 3/P	- 3/8	-0.9
O	INFONATIONAL INC	1- 2	3/4	0	0.0
O	INFORMATICS	2- 6	5 5/P	0	0.9
O	I.O.A. DATA CORP	1- 1	5/R	0	0.0
O	IRS CONPUTER MARKET.	1- 5	1 3/4	+ 1/8	+7.6
O	KEANE ASSOCIATES	3- 4	5 1/4	+2	+P1.5
O	KEYDATA CORP	P- 12	P	0	0.0
O	LOGICON	3- T	3 T/P	- T/8	-18.4
A	MANAOEMENT DATA	2- 5	2 1/R	+ 1/4	+13.3
O	NATIONAL CSS INC	1R- 42	29	+ 1/2	+1.T
O	NATIONAL CONRUTEP CO	1- 1	3/0	0	0.0
O	NATIONAL INFO SPVCS	1- 2	1/2	0	0.0
R	ON LINE SYSTENS INC	12- 21	21	+ 1/A	+1.2
N	PLANNING PESEARCH	2- T	3 1/R	+ 1/8	+4.1
O	RROOPAMMINO METHOOS	21- 25	21	0	0.0
O	RROOPAMNINO P SYS	1- 1	5/R	- 1/8	-10.8
O	RARIOATA INC	5- 24	4 T/R	- 1/4	-4.8
O	SCIENTIFIC COMPUTEPS	1- 3	3/4	0	0.0
O	SINPLICITY COMRUTER	1- 4	1 1/4	0	0.0
O	TRS CONPUTEP CENTEPS	2- P	S 1/2	0	0.0
O	TCC INC	1- 1	3/8	0	0.0
O	TYNSNARE INC	P- 13	12	- 5/P	-4.9
O	UNITEO DATA CENTEP	3- 6	3 1/2	+ 1/A	+T.6
A	URS SYSTENS	4- R	4 5/P	0	0.0
N	RYLY CORP	4- 11	5 1/4	+ 1/A	+5.0
	PERIRHERALS P SUPSYSTEMS				
N	AOORESSOGRAPH-MULT	12- 34	1T 3/8	+1 3/8	+8.5
O	ADVANCEO NEMOPY SYS	5- 23	8	+1 1/2	+23.0
N	AMREX CORP	4- 7	5 5/P	+ 3/4	+15.3
O	ANOEPSON JACOBSON	3- P	3	- 3/4	-20.0
O	PEENIVE MEOICAL ELEC	5- 10	P	- 1/2	-5.8
A	BOLT.PERANEK P NER	6- 12	9 3/4	+2 1/4	+30.0
M	PUNKEP-PANO	6- 1R	11 3/A	- 1/4	-2.0
A	CALCOMP	5- 15	15	+2 1/8	+10.5
O	CAMPRIOGE REMORIES	8- 1T	1P	-1	-5.8
O	CENTRONICS DATA COMP	13- 3R	30 1/2	-5 1/2	-15.2
O	COOEX CORP	9- 19	14	+1 1/2	+10.3
O	COGNITRONICS	1- 3	1 1/A	- 3/8	-23.0

EXCH		PRICE 1973 RANGE (1)	CLOSE OCT 4 1973	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMRUTER COMMUN.	1- 4	5/R	- 1/8	-1P.P
A	COMPUTER EOUIRMENT	2- 3	2 1/0	+ 1/8	+P.2
O	COMRUTER NACHINFRY	5- 13	T T/P	0	0.0
O	COMRUTEP TRANSCEIVEP	1- P	1 5/R	- 1/4	-13.3
N	CONRAC COPP	15- 32	21 3/4	+2 1/4	+11.5
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	9- 1R	1T 1/2	+1 3/A	+11.1
A	OATA RROOUCTS CORP	2- 4	3 3/4	0	0.0
O	OATA MECOGNITION	2- 3	1 1/2	0	0.0
O	OATA TECHNOLOGY	2- 5	2 5/R	- 1/8	-4.5
O	DECISION DATA COMPUT	P- 40	12 1/2	-2 1/A	-15.2
O	OELTA OATA SYSTENS	1- 1	3/P	- 1/8	-25.0
O	OI/AN CONTROLS	1- 4	3 1/4	+ 1/2	+18.1
N	ELECTRONIC N & M	3- 6	5	+ 3/8	+8.1
O	FARRI-TEK	2- 5	3 5/8	- 1/4	-8.A
O	GENERAL COMPUTER SYS	5- 9	P 3/4	0	0.0
N	GENERAL ELECTRIC	56- 7P	PA 1/4	+ 3/4	+1.1
N	HAZELTINE CORR	5- 9	8 3/4	0	0.0
O	INFOREX INC	5- 23	S 5/8	- 1/8	-2.1
O	INFOPMATION OISRLAYS	1- 2	3/P	+ 1/8	+50.0
O	INFOPMATION INTL INC	10- 15	13	0	0.0
A	LUNOY ELECTRONICS	3- 9	A	0	0.0
O	MANAGEMENT ASSIST	1- 1	3/R	+ 1/8	+50.0
A	MILGO ELECTRONICS	14- 2R	21 3/4	+1 3/8	+P.7
N	MOHAWK DATA SCI	A- 13	8	+ 3/8	+0.P
O	ODEC COMRUTER SYST.	2- 6	1 7/R	- 1/8	-P.2
O	OPTICAL SCANNING	2- P	S	-1 1/4	-20.0
O	PERTEC COPP	4- 8	8 5/A	+1 7/8	+39.A
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTPUMENT	3- 9	5	+ 5/8	+14.2
O	RRECISION INST.	2- 6	4	+1 1/4	+A5.A
O	OUANTOR CORP	5- 10	8	- 1/4	-A.0
O	RECOGNITION EOUIP	4- P	4	- 5/8	-13.5
N	SANOERS ASSOCIATES	T- 18	11 3/4	+ 3/4	+P.8
O	SCAN DATA	1- 6	3 7/R	+ 5/8	+19.2
O	STORAGE TECHNOLOGY	11- 34	21	+ 3/4	+3.T
O	SYCOR INC	9- 20	18 3/4	- 3/4	-3.R
O	TALLY CORR.	2- 14	A 1/2	- 1/4	-5.2
O	TEC INC	P- 9	8 3/4	+ 1/4	+2.9
N	TEKTRONIX INC	3R- 53	51 1/R	+ T/8	+1.7
N	TELEX	3- P	P 1/R	+1 1/8	+22.5
O	WANOCO INC	T- 13	11 3/4	- 1/2	-4.0
O	WILTEK INC	8- 18	10 1/2	- 3/4	-P.8
	SURRLIES P ACCESSORIES				
O	BALTIMORE BUS FORMS	5- 9	5	+ 1/8	+2.5
A	RARPY RRIGHT	6- 13	8	+ 3/A	+10.3
A	DATA DOCUMENTS	17- 2P	23 3/A	-1 3/A	-P.P
O	OURLEX PRODUCTS INC	7- 10	8 3/8	0	0.0
N	ENNIS PUS. FORMS	5- P	7 1/4	+ 5/8	+9.4
O	GRAHAM MAGNETICS	9- 20	13 3/4	+ 3/A	+5.7
O	ORARMIC CONTROLS	P- 12	9 1/8	- 1/4	-2.6
N	3M COMPANY	78- 91	P5 1/A	-4 3/A	-5.2
O	NOOPE CORP LTO	53- 60	58 1/4	+2 1/4	+4.0
N	NASHUA CORP	A2- 58	51 3/4	-1	-1.8
O	REYNOLOS & REYNOLO	40- 51	4P 3/4	-1	-2.0
O	STANOARO REGISTER	1A- 20	1P 1/4	+ 1/4	+1.5
O	TAP RROOUCTS CO	8- 23	11 1/2	0	0.0
N	UARCO	15- 23	17 1/2	+ 1/2	+2.9
A	RABASH MAGNETICS	5- 7	7	+ 3/4	+12.0
N	WALLACE PUS FORMS	15- 28	21 1/4	+ 3/4	+3.P

ITEL INTRODUCES THE TIE THAT DOESN'T BIND.

Our new short-term IBM 370 System lease.

It's a 2 or 3 year Packaged Operating Lease. For the company that values flexibility, but doesn't want to pay a premium for it.

Here's how it works:

ITEL will lease you an IBM 370 Central Processing Unit, plus ITEL's 7330 Disk Subsystem and ITEL Memory. At up to 40% savings over IBM's rental on an equivalent system.

This way, you keep your freedom and conserve capital at the same time.

ITEL's short-term IBM 370 System lease plan is another innovation from the people who pioneered IBM 370 Financial Packaged Leases. The same people who have already arranged for the lease of $400 million of IBM computer equipment.

So, if your company's plans call for short-term use of the IBM 370, you'll save big by calling the Data Products Group at ITEL—the financial alternative to IBM.

ITEL CORPORATION One Embarcadero Center, San Francisco, Calif. 94111 (415) 989-4220

Please send me more detailed information on your short-term IBM 370 leases.

Name _____ Title _____

Company _____ Phone _____

Address _____

City _____ State _____ Zip _____ C-1010